VOLUME 1 NUMBER 2 FEBRUARY 1994

OS/2 MAGAZINE

Peer-to-Peer Networking

Faxing From OS/2

The Hottest Books for '94

NetWare Made Easy

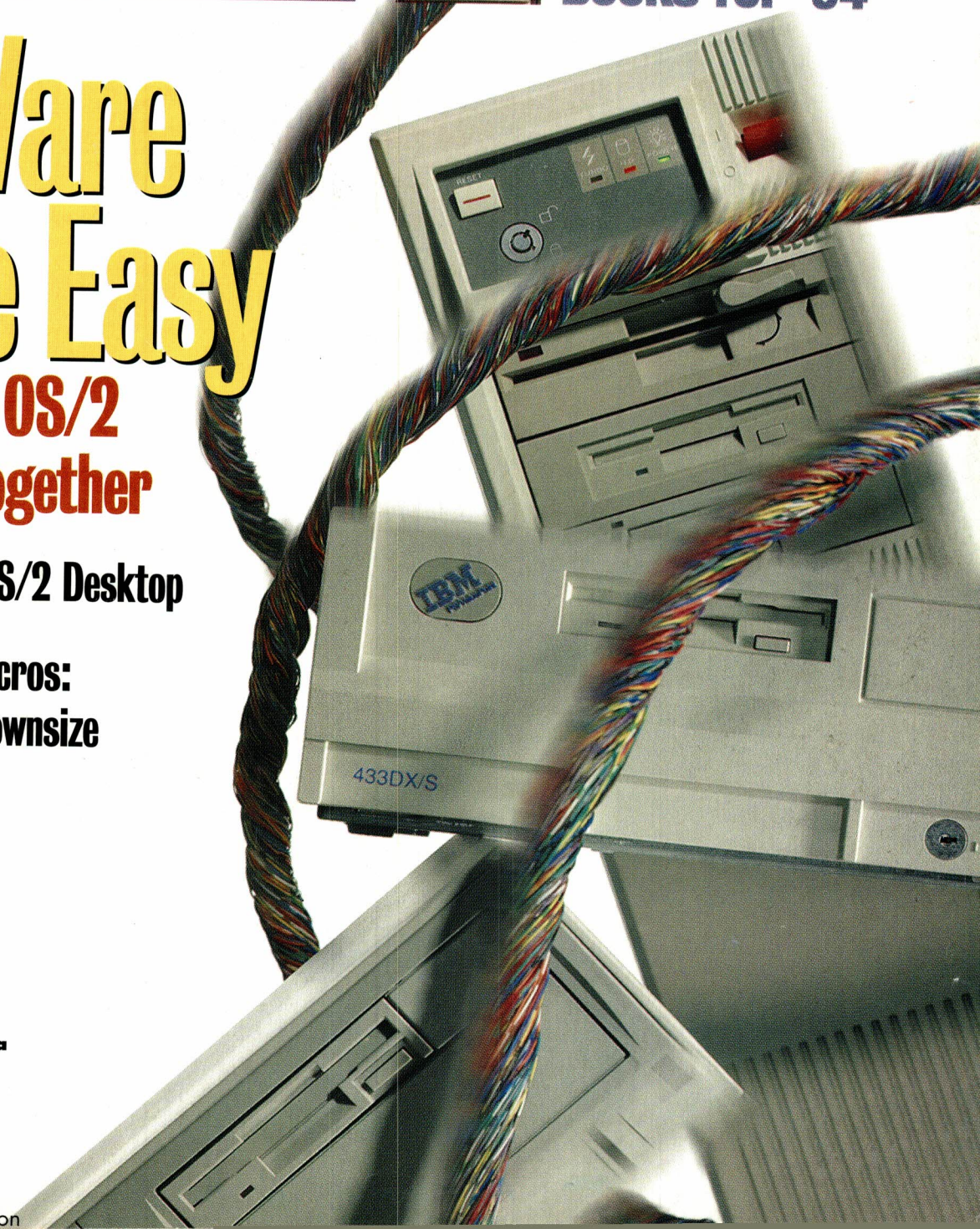
Tying Your OS/2 Network Together

Customize The OS/2 Desktop

Mainframe to Micros: 15 Ways to Downsize

REVIEWED:

F Works vs. Fax/PM
den CommPass
CA-Realizer



$3.95 US/$4.95 Canada

02

0 09128 48943 8

A Miller Freeman Publication

Pose your toughest questions to more than 100 vendors of OS/2 products.

Choose from more than 100 classes taught by independent experts.

Network with thousands of other OS/2 users and managers.

CONFERENCE & EXHIBITION

July 19-22, 1994

Santa Clara Convention Center

Santa Clara, California

Announcing the 1st Annual OS/2 World Conference & Exhibition

Are you tired of hearing *only* about Windows®? Do you want more support in your day-to-day use of OS/2? Is your company struggling to integrate OS/2 into its enterprise computing strategy? *If you answered "yes" to any of these questions, then the* OS/2 World Conference and Exhibition *is a can't miss event for you.*

OS/2 is taking the world by storm, winning plaudits from critics, reviewers, and users as the best 32-bit operating system for the desktop. The OS/2 World Conference and Exhibition offers you the lectures, workshops, tutorials, and exhibits to keep your finger on the pulse of OS/2.

Get the Answers to Your Toughest Questions. Get the Most Out of OS/2.

Over 100 lectures, workshops, and tutorials allow you to create a custom-made technical program. Tracks like Client/Server Computing, Enterprise Area Networking, Systems Administration, Multimedia, OS/2 Power Computing, and Corporate Software Development will keep *your program* focused on *your needs.*

Whether you're interested in finding out more about networking OS/2, using OS/2 on the server, customizing the Workplace Shell, programming in REXX, or using OS/2 in heterogeneous environments, the OS/2 Conference and Exhibition has what you want.

Here Are Some of the Classes Being Offered at OS/2 World

- Debugging OS/2 Printing Problems
- Auditing and Evaluating your Network's Security
- Optimizing Distributed Network Performance
- Databases under OS/2
- Migrating applications from 32-bit UNIX
- Object-oriented design for OS/2
- Designing robust client/server applications
- Moving to the SOM and DSOM models
- Optimizing distributed database performance
- Working with the OS/2 X Window Server
- OS/2 connectivity with DEC VAX systems
- Optimizing LAN Server networks for OS/2 workstations
- Implementing enterprise imaging solutions under OS/2
- Taking advantage of symmetric multiprocessing with OS/2
- LAN Server disaster planning & recovery
- E-mail under OS/2: from cc:Mail to Internet SNMP
- Benchmarking LANs: Finding the faster and most robust solution
- Remote network administration using OS/2 system services

The World's Largest Product Exhibition Dedicated to OS/2

Kick the tires and check under the hood for the hardware and software that can make your system scream. Over 100 vendors will be displaying the latest tools and technologies dedicated to OS/2.

Leading industry suppliers will be showcasing applications software, communications hardware and software, databases, network solutions, utilities, multimedia tools, and more. They will let you test out the newest products and pose your toughest questions to the people who have the answers.

See the Future of OS/2 — Today!

Running parallel to the technical program will be dozens of presentations by key visionaries at IBM and major OS/2 hardware and software providers.

Industry-Wide Sponsorship Guarantees a Top-Quality Event

Produced and owned by Miller Freeman, Inc., the third largest tradeshow producer in North America, the OS/2 World Conference and Exhibition is presented in cooperation with the IBM Corporation and sponsored by *OS/2 Magazine, OS/2 Developer, DBMS, Database Programming and Design, LAN Magazine, STACKS: The Network Journal, Software Development and Dr. Dobb's Journal.*

Phone fax, or mail today for more information on the OS/2 World Conference and Exhibition.

YES! Please send me info on: ☐ Attending ☐ Exhibiting

NAME

TITLE PHONE

COMPANY FAX

ADDRESS

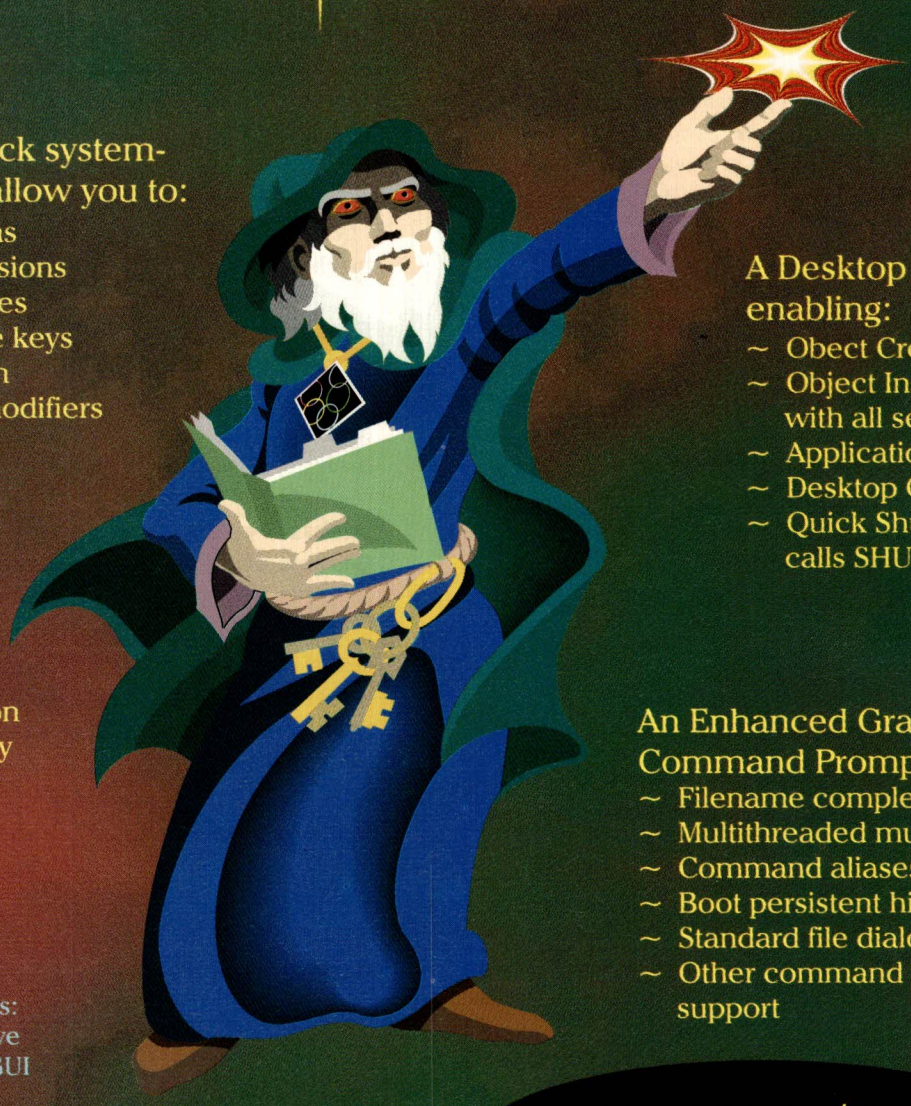
CITY STATE/PROV. ZIP

OS/2 World Conference and Exhibition Attn: JulieAnn Lee
600 Harrison Street, 4th Floor, San Francisco, CA 94107-9603
Phone: (415) 905-2354 Fax: (415) 905-2220 **0S22**

Reader Service No. 1

Introducing Macromancer

OS/2 brings you a World of Applications.
It takes a strong hand to rule the World!



Record and playback system-wide macros that allow you to:

- ~ Launch applications
- ~ Jump between sessions
- ~ Insert key sequences
- ~ Remap and disable keys
- ~ Assign hotkeys with Alt, Ctrl and Shift modifiers

A Desktop Assistant enabling:

- ~ Obect Creation
- ~ Object Instantiation with all settings
- ~ Application menus
- ~ Desktop Cleanup
- ~ Quick Shutdown, which calls SHUTDOWN.CMD

A Screen Saver with real security offering:

- ~ Password protection
- ~ Integration with any other Screen Saver
- ~ Timed or hotkey invocation, even from fullscreen

An Enhanced Graphical Command Prompt featuring:

- ~ Filename completion
- ~ Multithreaded multidisk file find
- ~ Command aliases
- ~ Boot persistent history
- ~ Standard file dialog access
- ~ Other command processor support

Norton Commander Users: Call for special competitive upgrade pricing! Soft & GUI customers: Call for your FREE UPGRADE!

ONLY $79

Laptop users, there is NO better way to navigate through OS/2! Former Desqview users, this is what you've been missing!

You may license the Macromancer technology to suit your own retail, vertical or in-house needs. Our professional developers kit includes key remapping and disabling, hotkey support, true keyboard hooking and password lockout.

Soft & GUI

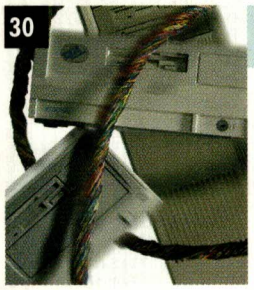
(800) SOFT-GUI *(718) 769-8017*

(718) 934-2133 FAX *(GO SOFTGUI)*

Reader Service No. 2

Table of Contents

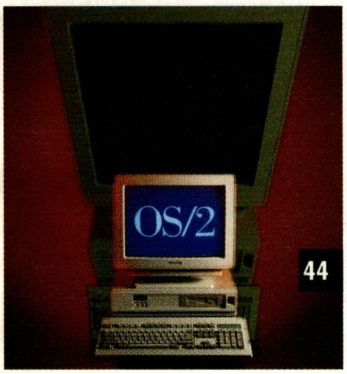
OS/2 MAGAZINE
Volume One Number Two
February, 1994



Cover Story

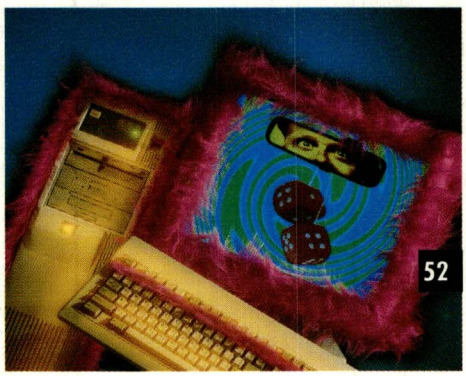
30 **NetWare Made Easy**
Like OS/2 2.1, the NetWare Client 2.01 for OS/2 is ready for prime time. Let's take a journey through this new network driver's features and installation process, and make the move to NetWare an easy one. *By Bob Panza*

Features



44 **Customizing your OS/2 Desktop**
Does Murphy's Law dictate that the number of icons increases to fill available screen space? Well, here's how to make the most of your monitor's limited real-estate, while saving yourself a few points and clicks along the way. *By Lenny Bailes*

52 **Downsizing to OS/2**
It's more than a buzzword: Downsizing is one of the business realities of the 1990s. But when downsizing starts, it's hard to keep everything in perspective. Here's a 15-step plan for moving from mainframe to OS/2-based microcomputers. *By Robert Chapman*



Reviews

59 **Faxing from OS/2**
Who needs a fax machine? Instead of wasting paper, you can use a fax modem to take care of all of your facsimile needs. Here's a comparison of two fax packages, SofNet's FaxWorks for OS/2, and Microformatic's Fax/PM.
By Esther Schindler

Columns:

15 The Big Picture
Industry analyst Amy Wohl answers the age-old question, "Can groupware be shrink-wrapped?"

21 Test Drives
OS/2 power user Brian Proffit gives the once-over to Computer Associates' CA-Realizer, Creative Systems Programming's Golden CommPass, and The Software Division's *sio.sys*.

71 The REXX Column
More REXX basics: Programmer Alex Lane explains the proper use of the language's *do* loops and *if-then-else* statements.

75 Migration Path
Matt Trask walks us through the issues of peer-to-peer networking under OS/2, including solutions with LAN Server and Windows for Workgroups.

78 Information Center
Read any good books lately? Dick Conklin tells us about OS/2 tomes available today and those expected to be published later this year.

84 Tips & Tricks
Technical expert David Reich talks about dual-boot partitions, on-line books, DOS device drivers, and more.

Departments:

7 Perspectives
Our take on WordPerfect's decision to cease development of WordPerfect 6.0 for OS/2.

9 Dateline: OS/2
All about IBM's hot new OS/2 for Windows, and the latest on OS/2 support for symmetric multiprocessing.

63 Just Announced
The latest news about the latest OS/2 hardware, software, and books.

OS/2 MAGAZINE

Editor-in-Chief
ALAN ZEICHICK

Managing Editor
GEORGE WALSH

Technical Editor
GUY WRIGHT

Assistant Editor
ALEXANDER ANTONIADES

Editorial Assistant
ANNE MELLINGER

Designer
BRIAN DAY

Art Director
EARL FLEWELLEN

Contributing Editors
DICK CONKLIN
ALEX LANE
DAVID MOSKOWITZ
BRIAN PROFFIT
DAVID REICH
MATT TRASK
AMY WOHL

Publisher
TED BAHR

East/Midwest Sales Manager
JAMES KAVETAS (212) 626-2546

East/Midwest Sales
LISA KRAUS (212) 626-2448

Western Sales Manager
CATHERINE MCCONVILLE
(415) 905-8115

Western Sales
MOLLY KNOX (415) 905-8126

Advertising Traffic Coordinator
LEO LAMATTINA

Marketing Manager
HEATHER CHAN

VP/Group Director
DONALD A. PAZOUR

VP/Director of Production
ANDREW A. MICKUS

VP/Director of Circulation
JERRY M. OKABE

Circulation Manager
SARA DECARLO

Newsstand Manager
PAM SANTORO

Subscription Questions
(800) 765-1291

Reprints
ANDREA VARNI (415) 905-2552

Miller Freeman
A MEMBER OF THE UNITED NEWSPAPERS GROUP

Chairman of the Board
GRAHAM J.S. WILSON

President/CEO
MARSHALL W. FREEMAN

Senior Vice Presidents
THOMAS L. KEMP
H. VERNE PACKER
WINI D. RAGUS

Vice Presidents
CHARLES H. BENZ,
LEONARD E. HAAS
VICKI L. MASSERIA,
ANDREW A. MICKUS
DONALD A. PAZOUR
JERRY OKABE

Chief Financial Officer
WARREN A. AMBROSE

APPLICATION TO MAIL AT SECOND-CLASS POSTAGE IS PENDING AT SAN FRANCISCO AND ADDITIONAL MAILING OFFICES.

ALL MATERIAL COPYRIGHT©1994 BY MILLER FREEMAN INC. ALL RIGHTS RESERVED.
PRINTED IN THE U.S.A.

Postmaster
SEND ADDRESS CHANGES TO: *OS/2 MAGAZINE*, CIRCULATION DEPARTMENT, PO BOX 56664, BOULDER,CO 80323-6664. TELEPHONE (800) 765-1291.

EDITORIAL POLICY: *OS/2 MAGAZINE* IS AN INDEPENDENT PUBLICATION WITHOUT OBLIGATION TO ANY HARDWARE OR SOFTWARE VENDOR, DEALER, OR DISTRIBUTOR. SEND EDITORIAL QUERIES TO *OS/2 MAGAZINE*, EDITORIAL DEPARTMENT, 600 HARRISON ST., SAN FRANCISCO, CA 94107.

ABC MEMBERSHIP APPLIED FOR OCTOBER 1993

ISSN #1073-1547

Reaching the OS/2 Magazine Editors

THE EDITORS OF OS/2 MAGAZINE ARE ALWAYS INTERESTED IN YOUR QUESTIONS AND SUGGESTIONS, PRAISE OR CRITICISM. OUR MAILING ADDRESS IS EDITORIAL DEPARTMENT, OS/2 MAGAZINE, 600 HARRISON ST., SAN FRANCISCO, CA 94107. OUR MAIN SWITCHBOARD IS AT (415) 905-2200, AND THE OS/2 MAGAZINE FAX NUMBER IS (415) 905-2499.

Electronic Mail

MANY OF THE OS/2 MAGAZINE EDITORS AND CONTRIBUTING EDITORS MAINTAIN ELECTRONIC MAILBOXES ON COMPUSERVE OR THROUGH THE INTERNET:

ALAN ZEICHICK	76703,756
OR	ZEICHICK@ACM.ORG
ALEXANDER ANTONIADES	71154,676
DICK CONKLIN	76711,1005
OR	OS2MAG@VNET.IBM.COM
ALEX LANE	75715,1370
DAVID MOSKOWITZ	76701,100
BRIAN PROFFIT	75300,1466
DAVID REICH	76711,632
MATT TRASK	MATT.TRASK@BIX.COM
CUSTOMER SERVICE	71572,341

COMPUSERVE MAILBOXES CAN ALSO BE REACHED THROUGH OTHER ELECTRONIC SERVICES. FOR EXAMPLE, THE FORMAT IS 76703.756@COMPUSERVE.COM FROM THE INTERNET.

CompuServe

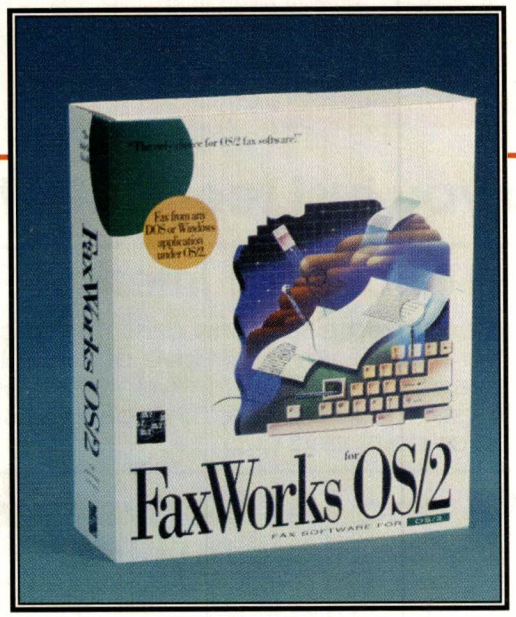
OS/2 MAGAZINE EDITORS CAN BE REACHED ON THE OS2AVEN FORUM ON COMPUSERVE. IF YOU'RE NOT FREQUENTING THE VARIOUS OS/2-RELATED COMPUSERVE FORUMS, YOU'RE MISSING A USER FORUM OR OS/2 MAGAZINE READERS, WRITERS, EDITORS, AND THE ENTIRE OS/2 COMMUNITY TO GATHER ELECTRONICALLY. IF YOU'RE A COMPUSERVE MEMBER, YOU CAN VISIT THE FORUM BY TYPING GO OS2AVEN AT THE COMMAND PROMPT. YOU'LL BE GIVEN THE OPPORTUNITY TO JOIN THE FORUM. GO AHEAD—THERE'S NO CHARGE BEYOND NORMAL COMPUSERVE RATES.

TO LEAVE FEEDBACK FOR OS/2 MAGAZINE EDITORS, TYPE GO MAIL AND SEND ELECTRONIC MAIL TO THE ADDRESSES LISTED ABOVE. DON'T BE PASSIVE! YOU CAN CONTRIBUTE TO THE SUCCESS OF THE OS/2 FORUMS BY WRITING AND LEAVING MESSAGES AND ADDING YOUR OWN PROGRAMS AND FILES TO ITS PUBLIC-DOMAIN AND SHAREWARE LIBRARIES.IF YOU'RE NOT A COMPUSERVE MEMBER, HERE'S HOW TO JOIN:

- SET YOUR COMMUNICATIONS SOFTWARE FOR 300, 1200, 2400, OR 9600 BITS PER SECOND (BPS), 7 DATA BITS, EVEN PARITY, 1 STOP BIT, AND FULL DUPLEX.
- TO FIND THE NUMBER NEAREST YOU, DIAL 800-346-3247 WITH YOUR MODEM (IN CANADA, DIAL 800-635-6225, VOICE ONLY). WHEN THE MODEM CONNECTS, PRESS ENTER. AT THE HOST NAME PROMPT, ENTER PHONES. FOLLOW THE MENUS AND NOTE THE NUMBER CLOSEST TO YOU. THEN HANG UP AND DIAL THE NUMBER YOU HAVE JUST FOUND.
- ONCE YOU'RE CONNECTED, PRESS CTRL-C. THEN ENTER THE FOLLOWING INFORMATION AT THE PROMPTS:

HOST NAME:	CIS
USER ID:	177000,5605
PASSWORD:	COMPUSERVE
AGREEMENT #:	CADENCE
SERIAL #:	93015

AFTER ENTERING YOUR BILLING INFORMATION, TYPE GO IBMOS2 FOR A MENU OF THE VARIOUS OS/2-RELATED FORUMS. NOTE THAT COMPUSERVE BILLS A MONTHLY FEE PLUS HOURLY CONNECT-TIME CHARGES.



FaxWorks™

The best OS/2™ fax solution

Introducing FaxWorks™ for OS/2

It works while you're in other applications. It works when you're not at your PC. It works from OS/2®, Windows™ or DOS applications. It works with ATM and TrueType fonts that come with OS/2. FaxWorks for OS/2 was born and bred for the Workplace Shell™, so it works in ways fax software created for lesser operating systems simply can't.

Efficient Faxing Is All In A Day's Work

FaxWorks' powerful features give you unmatched "paperless fax" capabilities. Create custom cover sheets with graphics and logos. Send faxes from applications running under OS/2 or directly from the Workplace Shell. FaxWorks alerts you when a fax arrives. Then you can easily view, save and print your faxes. With annotation tools for cutting, pasting, freehand graphics and text insertion, you can even mark up and edit faxes right on your screen and fax them out again.

FaxWorks Does It All

FaxWorks for OS/2 is available for single and multi-user environments, with support for AS/400 and mainframe faxing. Additional modules include support for OCR, PCL, DOS/Windows clients and multi-channel fax boards. To order or to find out more about the FaxWorks family of products including DOS, Windows and LAN versions, call 1-800-FaxWorks.

SPECIAL OFFER

$99.00

SOFNET

The Standard in Fax Software

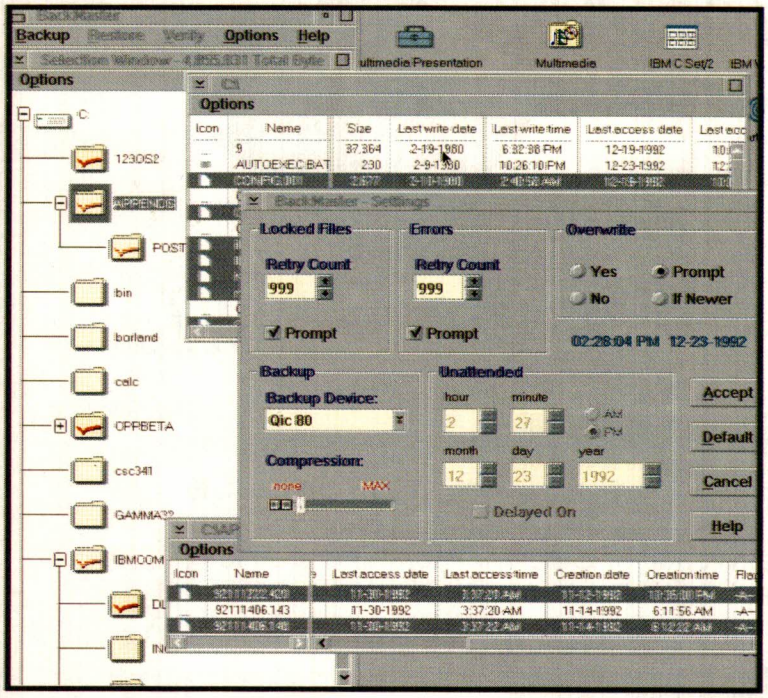
1-800-FaxWorks

1110 Northchase Pkwy. Suite 150 / Atlanta, Georgia 30067
(404) 984-8088 Fax (404) 984-9956

FaxWorks is a trademark of SofNet, Inc. Developed by Keller Group, Inc. OS/2 is a registered trademark of International Business Machines, Inc.. Windows is a trademark of Microsoft Corporation. All other referenced products are trademarks or registered trademarks of their respective manufacturers.

Why Take Chances?

Is your data backed-up, or do you just feel lucky?



BackMaster

32-Bit Backup for OS/2 2.1

Multi-Threaded!

ONLY $79.95

OS/2 Available and Ready!

30 DAY MONEY BACK GUARANTEE!

Easy to use PM Interface

File selections are fast and easy. If you can open a Work Place Shell Drive or folder Icon, you already know how to navigate through the file selection process. Selecting files is as simple as point and click.

HPFS and FAT file systems

BackMaster supports both FAT(File Allocation Table), and HPFS (High Performance File System). Backs up Extended Attributes, files with Long File Names, Workplace Shell, and System files.

Backup to QIC40/80 Tape!

BackMaster supports a variety of QIC-40/80 floppy based tape drives including Archive XL, CMS Jumbo, Conner 250, IOmega 250, Mountain 4000/8000, and Summit 120/250

Read your old DOS tapes!

Because BackMaster uses a standard QIC format for tapes instead of a proprietary format, you can easily read QIC-40/80 DOS tapes. To Migrate from DOS to OS/2, simply backup using your DOS software and restore with BackMaster.

Variety of Backup Options!

Make Total, Partial, or Incremental backups in the background or unattended.

Uses STAC Data Compression.

Uses Data Compression from STAC Electronics for performance and reliability. Compression ratios average 2:1.

Free Demo on our BBS.

Call our BBS for a free demo version. BackMaster makes backing up OS/2 so easy, you will backup more often.

MSR Development

P.O. Box 632070, Nacogdoches TX, 75963

Voice: (409) 564-1862, BBS: (409) 560-5970
FAX: (409) 560-5868

Perspectives

The Big Good-Bye

We heard the first rumblings in November, but it became official in a letter from Alan Ashton, WordPerfect Corp.'s CEO: There will be no WordPerfect 6.0 for OS/2.

Ashton's letter says, "WordPerfect Corp. currently has a number of accounts that are running Windows and DOS versions of WordPerfect on the OS/2 operating system, and the company encourages other customers to evaluate this option... WordPerfect Corp. will accommodate users who wish to make a transition from WordPerfect 5.2 for OS/2 to WordPerfect 6.0 for Windows and DOS."

So much for OS/2, he was saying—only three months after WordPerfect 5.2 for OS/2 became generally available, and at a Comdex where OS/2 reigned supreme, and Windows NT was barely evident.

Is WordPerfect's stand on OS/2 final? It seems so. Ashton says, "WordPerfect's OS/2 developers have been reassigned to integrate WordPerfect's Windows products with the OS/2 Workplace shell, as well as developing OpenDoc and 32-bit Windows applications." WordPerfect's future, it seems, lies next to Microsoft.

We tracked down one of the managers of WordPerfect's OS/2 team. He shared two interesting facts:

- WordPerfect 5.2 for OS/2 was profitable for the company.
- WordPerfect 6.0 for OS/2 was 19 days from code completion when the decision was made to stop development. *19 days*!

Why is WordPerfect turning its back on a fast-growing community of users, when their old version was profitable and the new version nearly ready? We were offered several reasons. I'll leave it for you to judge their value—but keep in mind that WordPerfect continues to develop its Windows NT word processor:

- The software industry operates on very low profit margins, much lower than only a few years ago. The installed base of OS/2 users isn't large enough to "make it up in volume."
- WordPerfect's only OS/2 product is their word processor. Their chief competition, Lotus Development Corp., offers not only Ami Pro for OS/2, but a new suite of products. Since they don't offer a suite, WordPerfect is at a tactical disadvantage.
- Because WordPerfect 6.0 for Windows runs so well under OS/2, the need for a separate version is hard to justify.

It's interesting. You'd think that WordPerfect Corp. would make the most of a booming market without native Microsoft applications. Instead, they turn their back on it.

What I find most disturbing is a possible precedent: If OS/2 compatibility becomes an "oh, by the way" item on a Windows development checklist, that'll mean an end to OS/2 innovation, and eventually an end to OS/2 itself.

What can we do? Tell software companies, with our letters, calls, e-mail, and dollars, that we want software that exploits OS/2's power and performance, not merely runs on it. Hey, if we wanted to run 16-bit Windows software, we would have stuck with Windows.

Alan Zeichick
Editor-in-Chief

It became official with a letter from WordPerfect's CEO: There will be no WordPerfect 6.0 for OS/2

At this software conference, bugs are cool.

So are lava lamps and bell-bottoms.

The theme of our conference is "retro," but the technologies are up-to-the-minute. That's why software designers, developers, technical coordinators, device driver developers, LAN specialists, MIS managers, consultants and training executives definitely shouldn't miss it.

TECHNICAL INTERCHANGE SAN FRANCISCO 94

Improve your productivity with sessions on OS/2,® LAN systems, graphics, OOP, multimedia, pen, database and communications. For device driver developers, special seminars on displays, printers, storage, LANs and input devices are offered.

Everyone is invited to experiment in our OS/2 and LAN lab, and see exhibits from software vendors who exploit PSP products.

See the latest PSP technologies, April 25–29, 1994
Now including the Device Driver Conference

Speakers include IBM's David Proctor, VP of the PSP Division, and John Soyring, Director of Software Development Programs, with an industry keynote address by Computer Associates International, Inc. Chairman and CEO Charles B. Wang. Also, enjoy premiums, raffles, a "special event" and more. Register before March 21, 1994 and save $100 on the $895 fee. For more information or to sign up, call 1 800 872-7109 (USA and Canada).*

It's gonna be groovy.

Operate at a higher level.™

*Outside the USA and Canada, call 1 508 443-4990. Volkswagen, the Volkswagen logo and "Beetle" are registered trademarks of Volkswagen, AG. Used by permission of Volkswagen, AG. IBM and OS/2 are registered trademarks and "Operate at a higher level" is a trademark of International Business Machines Corporation. © 1993 IBM Corp.

IBM®

OS/2 for Windows

A NEW VERSION OF OS/2, AND SMP TOO.

OS/2 FOR WINDOWS

By Dick Conklin

OS/2 2.1 Special Edition for Use with Windows Version 3.1 is the latest in the evolution of OS/2. Now there's an operating system that can coexist with another operating environment—Windows. But, as interesting as this new product is, the future promises a lot more for OS/2.

OS/2 without Windows

The new packaging is a low-cost alternative to the all-or-nothing approach of previous OS/2 installations. If you already have Windows installed, there's no need to replace it. Now OS/2 attaches to Windows, letting you run existing Windows applications without change. Instead of providing a built-in Windows-OS/2 (Win-OS/2) environment, OS/2 for Windows simply uses what is already there.

Now OS/2 attaches to Windows, letting you run existing Windows applications without change.

This clever approach has several advantages: Windows applications run in their own protected virtual DOS machines (VDMs), just as they do on OS/2 2.1; VDMs exploit a feature of the 80386/486/Pentium family that isolates applications from each other and from the operating system. Each application runs in its own private address space—if one fails, it can be shut down and restarted without rebooting the whole system.

The lower price is another advantage. The $49 promotional rate for the version without Windows reflects the slimmer packaging. No Windows code is provided, so fewer diskettes are needed, and installation time is shorter. OS/2's Win-OS/2 files aren't needed, so about 7MB of hard disk space is saved. And since this product is created entirely by IBM, no royalties are owed to Microsoft by IBM. You are paying for OS/2 and nothing more.

Figure 1 illustrates the basic components. Windows 3.1 and DOS have been previously installed on a system sporting an 80386 or higher processor. The addition of OS/2 for Windows didn't disturb anything since the system can be a dual-boot machine running DOS and Windows and OS/2 2.1 on the same hard file. System requirements are roughly the same as those for the full OS/2 2.1 version; 20 to 40MB of hard disk space and 4MB memory (6MB recommended).

Most importantly, OS/2's personality remains unchanged. An operating system's personality has two characteristics: a visual interface for the user, and a software interface for applications. From the user's point of view, OS/2 for Windows looks and acts like OS/2 2.1's Workplace Shell, even when Windows applications are running. All applications—DOS, Windows and OS/2—recognize a familiar personality or environment. They behave exactly as they would on a native OS/2 2.1

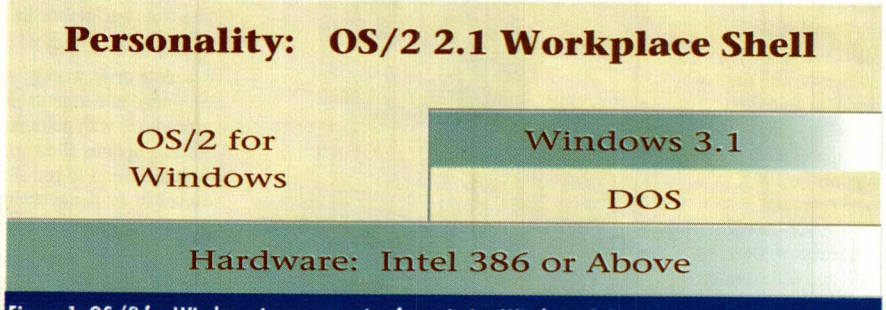


Figure 1: OS/2 for Windows is an extension for existing Windows 3.1 systems.

system. If you choose to reboot DOS, your system's original DOS/Windows personality resumes and OS/2 is ignored.

The future: split personalities? Choosing OS/2 for Windows is a good tactical measure, a way of painlessly introducing OS/2 to the masses of Windows users. But what about the DOS user who only needs DOS with a Workplace Shell? Can an operating system have a split personality that's friendly to DOS applications but that also has a workplace shell that resembles OS/2's? Could the same shell be adapted to UNIX systems?

Apart from the issue of personality is portability. My operating system might have a Workplace Shell and be able to run all of my applications, but I can't load it on my fast new RISC machine. Today, most operating systems are locked into a particular family of processors: Intel for IBM, Motorola for Apple, and RISC for some UNIX systems.

IBM is addressing both personality and portability in its future operating system strategy. While specific dates are not being revealed, their plan seems to have all of the bases covered.

One of the first steps is adapting the Workplace Shell to DOS and UNIX (AIX). This will bring OS/2's user interface to these two popular operating systems, making it easier for people to learn one and then move on to another one. Of course, the DOS and UNIX shells won't be identical to the original OS/2 version, because their supported functions differ. But their look and feel will be basically the same.

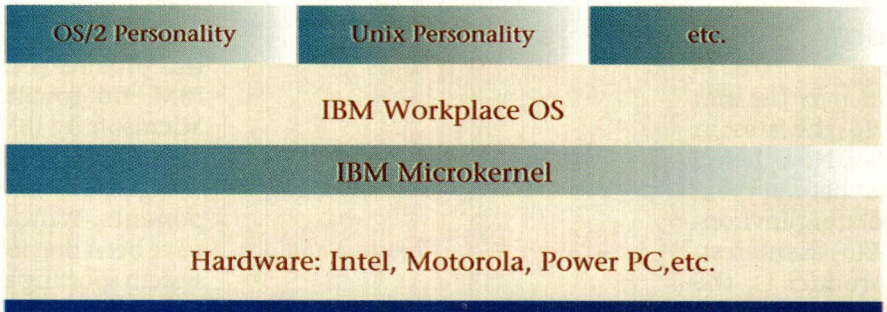


Figure 2: IBM's Workplace OS will be built from the ground up, a new operating system with multiple personalities and processor support.

Automate System Operations on OS/2 Workstations & Servers!

Automate backup, recovery, scheduling and system building with Sytron's easy-to-use OS/2® software utilities.

Sytos Plus® for OS/2

Backup and restore OS/2 workstations and servers running Microsoft® LAN Manager and IBM® LAN Server with the industry-leading Presentation Manager backup application. Sytos Plus offers extensive functionality, unparalleled reliability, complete support for HPFS, FAT, long pathnames and extended attributes, and the fastest server-based backup and restore performance. Over 150 industry-leading QIC and SCSI storage devices are supported.

Sytos Rebound™

Recover OS/2 in less than 10 minutes. Sytos Rebound protects your system from lengthy downtime by providing full recovery of the operating system including HPFS files, applications and data files from backup media created by Sytos Plus.

Sytos Scheduler™

Schedule daily, weekly, and monthly events for command and executable files, or Sytos Plus procedures with point-and-click functionality. Flexible options allow you to schedule single and multiple events to run at off-peak hours, overnight, or in the background.

Sytos Repro™

Build new OS/2 systems with the same configuration using Sytos Repro, backup media and a parallel port storage device.

To order or to receive more information, CALL 800-877-0016 or 508-898-0100

Ask for Special Bundle Pricing

Sytron®

Ready!™ for OS/2

Sytron Corporation ■ 134 Flanders Road ■ Westboro, Mass. 01581

Sytron and Sytos Plus are registered trademarks, and Sytos Rebound, Sytos Scheduler and Sytos Repro are trademarks of Sytron Corporation. All other brand and product names and logos are trademarks or registered trademarks of their respective owners. Specifications subject to change without notice. ©1993 Sytron Corporation, a subsidiary of Rexon, Inc. All rights reserved.

Reader Service No. 5

The schizophrenic Workplace OS

The next generation IBM operating system is tentatively called Workplace OS. Figure 2 illustrates this new creation, built entirely from scratch using object-oriented programming technology that benefits both users and programmers. Workplace OS will offer multiple personalities so that a single PC will be able to run DOS, Windows, OS/2, and UNIX applications together. Applications running on different personalities will be able to interact with each other. One of the personalities—in this case OS/2—is called the dominant personality. Through it, the user can call programs designed for other personalities, such as UNIX applications.

Layered on top of the new IBM microkernel, Workplace OS will be a truly portable operating system, able to run on several processor platforms.

Microkernel: a common platform

Today, operating systems are locked into the microprocessors they were designed for. You can't run DOS, Windows or OS/2 on a Macintosh, and you can't run the

Parallel processing anyone?

One of OS/2's biggest advantages is its support of multitasking and multithreaded applications. You can copy diskettes while downloading a file and recalculating a spreadsheet because the work is divided among multiple hardware devices: diskette drives, modem, hard drive, and processor. But running five compute-intensive threads at the same time won't buy you much if the work has to be funneled through the same microprocessor.

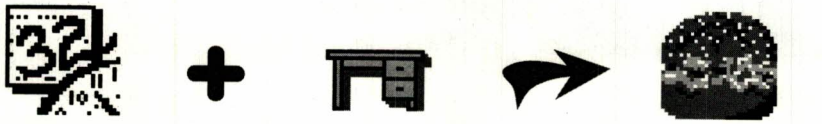
It wasn't bundled in OS/2 2.1, but OS/2's support for symmetric multiprocessing (SMP) is now in beta testing. SMP takes advantage of PCs that have multiple processors installed by monitoring system work loads and allocating work among them.

As you might guess, real multiprocessing can yield some impressive gains in performance. Applications that are compute-intensive in graphics or database access are good candidates for SMP, and file servers should see a big improvement. But even single-threaded DOS applications will see some gains, since OS/2's background system services can now run on a different processor.

IBM unveiled OS/2 SMP at COMDEX this fall, demonstrating it on a five-processor system running a transaction database, computer-aided design application, and a spreadsheet **—Dick Conklin.**

"Relish is a robust, rich product with elegant integration into the OS/2 environment."
- OS/2 Magazine, Premier issue, 1993

and it's getting even better...



Relish® Hot Buns

bringing object technology to desktop calendaring

more effective time management — coming soon to a desktop near you

Sundial Systems Corporation 310•596•5121

Copyright © 1994 Sundial Systems Corporation. Relish is a registered trademark of Sundial Systems Corporation. OS/2 is a registered trademark of International Business Machines Corporation.

Reader Service No. 6

Mac's System 7 operating system on a PC. That's because the *kernel* of an operating system is so interdependent on the hardware it was written for.

Carnegie-Mellon University's *Mach 3 Microkernel* project set out to change that. By isolating a set of kernel functions common to all operating systems, a smaller core operating system kernel, or microkernel, could be written for each family of processors (Figure 3). Unlike Workplace OS, which is machine-independent, the microkernel provides machine-dependent services such as message handling, execution (threads) scheduling, memory management, and input/output calls.

Each microkernel implementation is customized to take advantage of a specific microprocessor family, such as Intel, Motorola, or Power PC. But its programming interface to the operating system must remain constant, regardless of hardware. The microkernel serves as a buffer between the OS and hardware. It is a stable base for portable, cross-hardware operating systems and their applications.

IBM teamed up with Carnegie-Mellon to enhance Mach 3 with additional functionality and improved performance. One enhancement was to remove device drivers from the microkernel itself, making it easier for a user to install additional device drivers as new hardware is added.

Unlike Workplace OS, the microkernel has no personality of its own, at least nothing that a user can see or an application developer can access. Only operating system developers can use its interface. Their work is simplified, however, due to the transfer of many old operating system kernel functions to the new microkernel.

Multiple processor systems

The IBM microkernel will also support symmetric multiprocessing (SMP—the ability to run several threads of executable code in parallel on multiple processors in the same system). Using IBM's Distributed Computing Environment (DCE), the threads can be allocated to other systems in the same network. This allows a system's workload to be off-loaded during peak periods, greatly enhancing overall performance.

DCE also means that the personality of an operating system (such as Workplace OS) can reside on one machine (such as a hand-held computer) while the microkernel and other functions (such as printer and file servers) are elsewhere on the network. Message-passing between operating system elements can take place on the same system or across the LAN.

If you are concerned that OS/2 2.1 may someday be replaced by an incompatible operating system, rest easy. IBM's history of upward compatible OS/2 releases and its Workplace OS Microkernel design emphasize compatibility. The success of OS/2 2.1's Workplace Shell personality has made it a standard for the future.

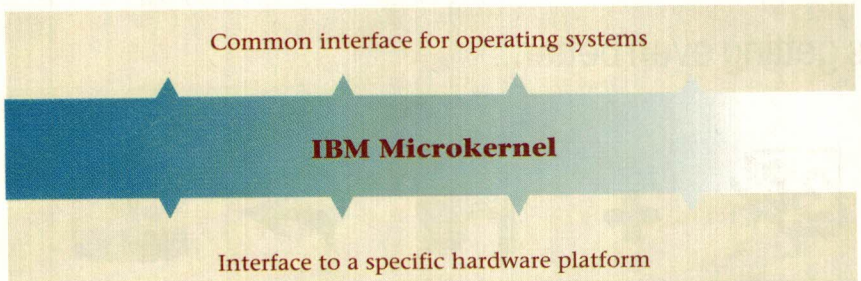


Figure 3: IBM's Microkernel provides a new layer between hardware and operating system. Its hardware side is customized to each family of microprocessors. Its operating system side is common to all versions, regardless of hardware. It provides a stable base for portable operating systems such as IBM's Workplace OS.

OS/2 FOR SYMMETRIC MULTIPROCESSING SYSTEMS ANNOUNCED AT COMDEX

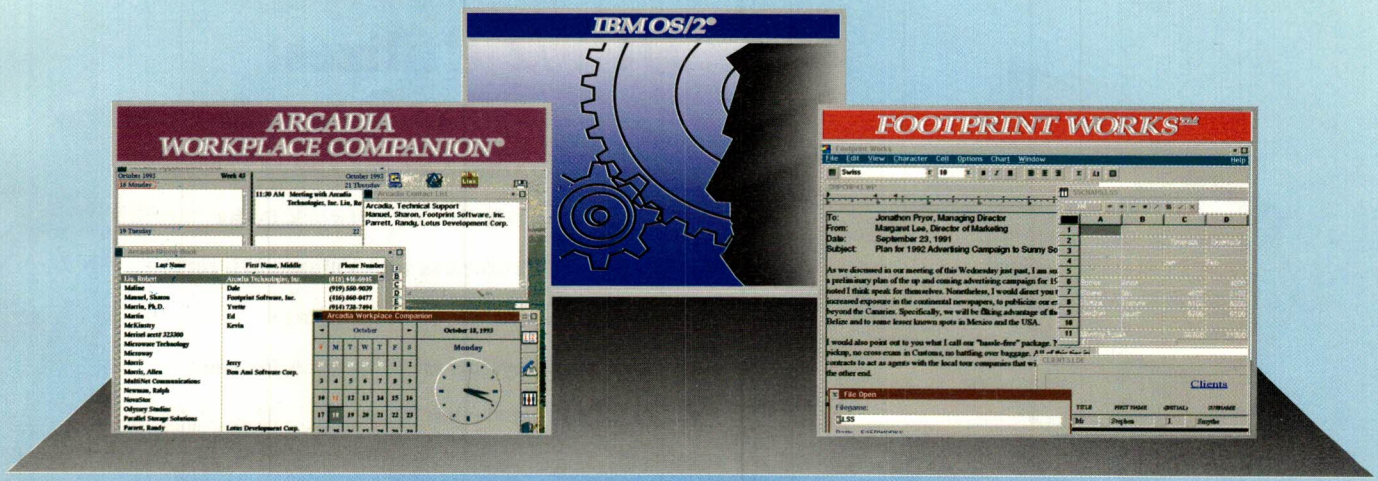
By Alexander Antoniades

IBM announced that a symmetric multiprocessing version of OS/2 2.1 is currently entering a beta testing cycle. OS/2 SMP, as it is called, is currently under development for 486 or above Intel-based multiprocessing systems. A variety of vendors such as ALR, AST, Compaq, Everex, IBM-PC Company, Tricord, and Wyse are working with IBM to ensure compatibility on existing SMP systems.

According to sources at IBM, OS/2 SMP will greatly extend the processing power of OS/2 for more high-end uses. Although OS/2 SMP will still run DOS and Windows programs, the greatest improvement will be seen in native OS/2 applications, which are multithreaded by nature and can make the best use of OS/2 SMP's ability to divide threads over several processors. It should also be noted, however, that 16-bit programs will also benefit from OS/2 SMP's use of threads to overlap system services.

IBM's demonstration at COMDEX ran on a five-processor system running Oracle version 7, IBM's DB2/2, Autodesk's AutoCAD, and Lotus' 1-2-3.

GET UP AND RUNNING WITH THIS OS/2® PRODUCTIVITY PACKAGE!



NEW!

EVERYTHING YOU NEED FOR THE SMALL BUSINESS IN ONE AFFORDABLE PACKAGE

IBM OS/2® FOR WINDOWS

OS/2 for Windows brings a new level of power and performance to your PC. OS/2 for Windows can exploit your hardware in ways it simply couldn't before. It doesn't replace your current setup. It enhances it. Your Windows desktop can look and work the same. Or you can start to explore the object - oriented world of the Workplace Shell and discover how easy and fun true "drop and drag" can be. The choice is yours! Make the most of what you've got with OS/2 for Windows! Run Windows applications right alongside your DOS favorites and new, blazing fast 32-bit programs - all at the same - with incredible reliability

ARCADIA WORKPLACE COMPANION®

Designed to be the integrated personal information manager for the OS/2 Workplace Shell environment. While the Workplace Shell gives you an object-oriented interface on top of a powerful operating system, the Arcadia Workplace Companion provides the applications that will make you more productive. Included in Arcadia Workplace Companion: A calendar with customizable alarms and holidays, an appointment book, a useful telephone/address book, and an easy access contact book.

FOOTPRINT WORKS™

Five integrated modules provide a complete range of productivity tools: Word processor, spreadsheet, charting, data filer and reporting. Footprint Works is the complete personal/business package to complement your existing office. And it's simple to use! Footprint Works' powerful hotlink feature keeps your document up-to-date. Change data in a spreadsheet, and have the change automatically reflected in your text document. Or, change the data field and have the report change. Put your best foot forward with Footprint Works for OS/2!

IBM OS/2 For Windows
with Productivity Software
Package Price:

$179.00
On CD

$189.00
On 3.5" Disks

MSRP
If purchased separately (on CD):
OS/2 for Windows: $99.00
Arcadia Workplace Companion: $149.00
Footprint Works: $149.00
$397.00

Order by 1/31/94 and save $218.00!

INDELIBLE BLUE Inc.

ORDERS: 1-800-776-8284
FAX: (919) 878-7479
Inquiries: (919) 878-9700

3209 Gresham Lake Rd. ◆ Suite 135 ◆ Raleigh, NC 27615 ◆ USA

OS/2 and IBM logo are registered trademarks of IBM Corporation. Workplace Shell is a trademark of IBM Corporation.
Windows is a trademark of Microsoft Corporation. All other trademarks and registered trademarks belong to their respective owners.

Reader Service No. 7

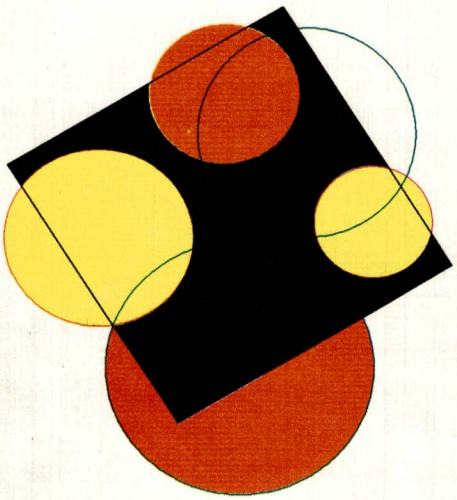
ALL New DCF/2
HPFS Version Update
Available NOW !

D C F / 2

The only pure OS/2 on-the-fly data compression product available today !

DCF/2 Utilizes:

- ✓ OS/2's High Performance File System (HPFS)
- ✓ All OS/2 DASD - FAT and Floppy Volumes
- ✓ Removable Media and Network Disks
- ✓ Password Protection and Volume Mirroring
- ✓ Existing Disks (no re-formatting)
- ✓ Dynamic Physical Disk Space Allocation
- ✓ OS/2's Presentation Manager



$149.95 *plus Shipping & Handling*

Ready! ™
for LAN Server

Increase Your Disk Capacity. How Much?

See For Yourself! Don't take our word for it ...

FREE !

Try Before You BUY !

Call today for a FREE copy of our Disk Compression Analysis Tool (DCAT).

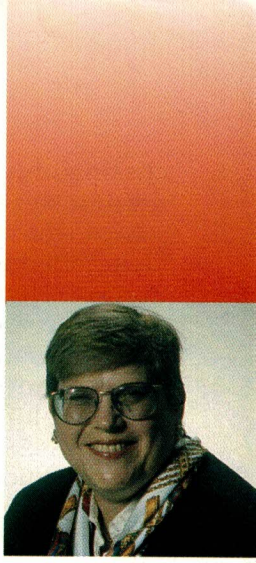
Find out how much disk space you really could have ...

Call 1-800-666-4672, (303) 484-2665 TODAY for your free copy of the DCAT or pick it up off of your favorite BBS, IBMLink (OS2DCF2), CompuServe (GO OS2AVEN/Proportional), or from Internet on the FTP.CDROM.COM.

COMDEX Special Offer: "Two Great Products, One Incredible Deal" bundle of the DCF/2™ and DeskMan/2™ from DevTech - now until the end of November. DeskMan/2 is the ultimate desktop manager for OS/2 and includes the new VUEMan/2 *virtual desktop manager*. Anyone who has ever had to rebuild their desktop will know the value of the DeskMan/2!
Call for details and come see us on the main floor IBM PSP Booth L860 Pedestal #31.

Proportional Software, 1717 Linden Lake Road, Fort Collins, CO 80524, Tel. (303) 484-2665, FAX (303) 484-2670, CIS 71333,2765
Development Technologies, Inc., 308 Springwood Road, Forest Acres, SC 29206-2113, Tel. (803) 790-9230

Reader Service No. 8



Can Groupware be Shrink-Wrapped?

IT'S ALL A QUESTION OF SUPPORT

BY AMY WOHL

Just as we are finally completing the infrastructure to enable groupware with reasonably powerful PCs on every desktop interconnected through local and wide area networks, that are supported by servers and robust network operating systems and services, we encounter the next complication.

Actually, pioneering groupware users can tell us all about it. Groupware is very different from shrink-wrapped software. In many ways, it is more like the software IS managers purchased for minicomputers than the personal productivity packages you can use right out of the box.

Groupware can't be purchased only because a single user wants to try it out. That would be like owning the only telephone in town. Groupware has to solve recognized group problems, and selling group solutions often takes substantial time and skilled effort.

Finding the appropriate product, however, can be difficult. Just walk into your favorite computer supermarket and ask for an incisive comparison of the top five database products; then ask for a demonstration copy. Good luck!

Groupware needs to be sold by savvy marketers who are willing to invest in the longer sales cycle and who also know enough about the customer's business to be able to identify suitable problems and then solve them. Sometimes, a groupware vendor fields his own direct sales force (as Lotus and Oracle do), but this effort is rarely enough to provide the reach their revenue ambitions require. Most groupware is sold through systems integrators, VARs, and consultants, who provide the expertise.

Groupware needs to be sold by savvy marketers who are willing to invest in the longer sales cycle

Groupware isn't very useful right out of the box. Most groupware requires some customization. At the very least, some administrative work must be done, including inputting user and group names, creating profiles, assigning passwords, and authority levels. Often, the groupware product is used as a kind of mini-platform, inviting the user to build macros or programs to support his own applications. In a mature groupware environment (Lotus is the best example, so far), commercial software developers offer add-on products that offer applications or tools for use on top of the groupware environment.

A company's on-site support staff can perform these duties, but it can be time consuming particularly if the groupware project has ambitious goals that encompass large groups, multiple departments or applications, or the need to access one or more host data bases.

Groupware provides complex applications that require more support than the shrink-wrapped channel is prepared to provide. Most shrink-wrapped software carries with it a great deal of free support, ranging from a 30-90-day warranty period to cover the initial installation and start-up period, to generous vendors who provide permanent toll-free support (via 800 lines) for their flagship products. In fact, support can be a major selling feature for some products.

Groupware needs a different kind of support and it needs more of it. The customization process may require on-site system analysis or programming. Implementing groupware projects may require training administrators, programmers, and users. Integrating groupware products with databases, communications environments, hardware, operating system platforms, and personal productivity software that is already in use is unpredictable and time-consuming.

We've interviewed dozens of users on this point and most of them agree that they'd rather buy and pay for excellent support, pur-

chasing only exactly what they need, instead of limiting themselves to the vendor's more meager "free" offerings. Those free offerings are often paid for dearly—in time spent waiting on the phone, in the frustration of trying to solve problems with vendors' staff who (through no fault of their own) don't possess the necessary skills, and in additional user organization support that is required when training is sparse.

The trouble is, groupware's need for more than shrinkware-type selling and support limits the marketability of products in this category, and the smaller revenues available to groupware products have diverted many talented developers away from the groupware market, seeking other, more profitable directions.

Products are generally sold in high volume through the shrink-wrapped channel and pretty much

Groupware has the potential to exploit the interconnected desktops we have invested in

only high-volume products provide high revenues to their owners, software developers, and publishers. Marketing products can, of course, be approached another way. You could, for example, sell the products cheaply, then make a business out of selling customized, carefully-crafted supplemental products. That is, you could take the Lotus Notes route and put your product out on the shrink-wrap shelves at more or less shrink-wrap prices, but work hard to put an infrastructure behind the product, providing thousands of sources for custom consulting, software, and training, to guarantee the product's success. Customers have to pay the real cost, but how it gets paid and who delivers what piece of the solution changes quite a bit.

The software publisher doesn't have to provide all the support infrastructure himself—he only has to help make it happen and point customers in the right direction.

The channel can be much more diverse, because the software and the support can travel via different modes of transportation

These methods could provide companies with more flexibility to adjust to different kinds of customer needs and market conditions. Lotus doesn't need to know everything—just how to write and publish the software and manage the business. Each part of the support feeding chain doesn't need to provide everything either, it only needs to do its part very well.

This idea will not appeal to those who like "one-stop shopping," but they can always go to a systems integrator or large systems or consulting firm that will put everything together for them and act as the general contractor. It works, in the end, like it did in the old days of big vendors and monolithic choice, but now you get a lot more choices.

Groupware has the potential to exploit the interconnected desktops we have invested in and provide us with interconnected information and coordinated communication. To get there, we need to understand that not all software is the same.

Amy D. Wohl is president of Wohl Associates, a consulting firm specializing in office information systems, personal computing, and end user computing. She is also editor of the Trendsletter, *a monthly newsletter on computer industry trends.*

Take control of your OS/2 scheduling needs with

ATS

Version 2.0b

Advanced Task Scheduler for OS/2

Are you looking for a way to manage your production job streams? Do you have programs that need to run after the completion of one or more other programs? Do you want to process files that have just been received from another system or modified locally? Do you need to schedule around holidays and periods of heavy CPU load?

With ATS, you can accomplish all of this and MUCH MORE. With ATS you can run your programs when YOU want them to run and you don't even have to be there to start or monitor them.

Here are some of the features of ATS for OS/2:

* Create True Job Streams
* Programs can be scheduled to run anytime.
* Programs can be dependent upon Files, Other Programs, Holiday Schedules, and External Signals
* Complete Logging - To File and Console
* Console Display of Running Tasks
* Console Display of Holidays, Events and Tasks
* Programming Interface for External Signals
* Only $249.00

MHR

Software and Consulting

2227 U.S. Highway #1 *Suite 146 * North Brunswick, NJ 08902

Voice: (908) 821 - 0359 Fax: (908) 821-0350

Reader Service No. 9

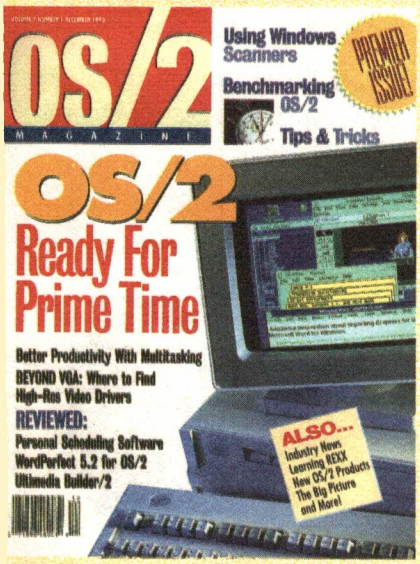
ATTENTION OS/2 USERS:

Introducing

OS/2

MAGAZINE

The new magazine for people who work with OS/2 every day. Written by the leading technical experts and writers, ***OS/2 Magazine*** helps you make the most of OS/2. Learn how to maximize the performance of your hardware and software, and how to select the best add-ons available today. Your computer and applications will run better than ever.



Subscribe Now!

...and take advantage of this Charter Subscription offer.

00% SATISFACTION GUARANTEED!

Charter Subscription Offer

YES! Please enter my Charter Subscription at just $29.95 for the next 12 issues. I save 37% off the cover price.

❑ Payment enclosed ❑ Bill me later

Name _____

Company _____

Address _____

City _____

State _____ Zip _____

Please allow six weeks for delivery. Foreign orders must be prepaid in U.S. funds. Canadian/Mexican subscription price: $39.95. All other foreign subscription price: $69.95. 4AA1

OS/2 MAGAZINE

Introductory Offer

YES! Please enter my Introductory Subscription at just $29.95 for the next 12 issues. I save 37% off the cover price.

❑ Payment enclosed ❑ Bill me later

Name _____

Company _____

Address _____

City _____

State _____ Zip _____

Please allow six weeks for delivery. Foreign orders must be prepaid in U.S. funds. Canadian/Mexican subscription price: $39.95. All other foreign subscription price: $69.95. 4AA1

OS/2 MAGAZINE

Two-Year Special Offer

YES! Please enter my Charter Subscription at just $49.90 for the next 24 issues. I save 48% off the cover price.

❑ Payment enclosed ❑ Bill me later

Name _____

Company _____

Address _____

City _____

State _____ Zip _____

Please allow six weeks for delivery. Foreign orders must be prepaid in U.S. funds. Canadian/Mexican subscription price $59.90. All other foreign subscription price $129.90. 4AA1

OS/2 MAGAZINE

♻ *Recycled Paper*

NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 1286 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

OS/2 Magazine
P.O. Box 56664
Boulder, CO 80323-6664

NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 1286 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

OS/2 Magazine
P.O. Box 56664
Boulder, CO 80323-6664

NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 1286 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

OS/2 Magazine
P.O. Box 56664
Boulder, CO 80323-6664

Introducing

OS/2

MAGAZINE

This magazine is for you!

Each month in *OS/2 Magazine* you'll find:

- Expert hands-on, how-to articles to help you understand the ins and outs of your OS/2 computer and software.
- Product reviews that give you the information you need to make smart purchasing decisions.
- Handy tips and tricks guaranteed to maximize your efficiency.
- News flashes about the latest OS/2 hardware and software.
- Analysis of the latest trends in the OS/2 community.

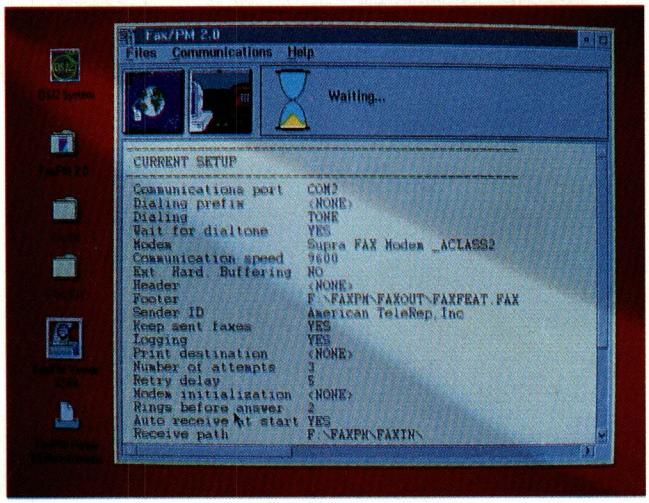
SAVE UP TO 48%

You'll find all this and more at special introductory prices. To start your subscription, detach and mail one of the postage-paid cards today!

Fax at a higher level

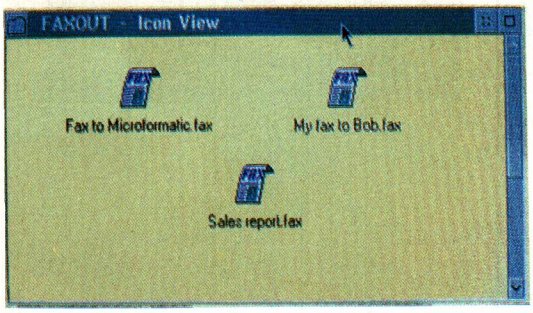
Whether you're in a Dos, Win-OS2 or OS/2 session running under OS/2 2.1, now you have the ability to send and receive faxes - without leaving the application. Just select the Fax/PM driver as your printer. To fax...just print!

Fax/PM 32-bit also really capitalizes on the advanced features of the Workplace Shell object-oriented interface. You can send faxes right from the Workplace Shell by simply dragging and dropping a data object to the fax object.



Features like these are too good to keep to yourself, so there are also Fax/PM versions available for LAN and Client-Server environments, all CID enabled.

And applications developers will appreciate SOM APIs that allow for integration of the Fax/PM engine into custom applications. We could go on about how Fax/PM can make your PC an even more productive place. But we'd rather let the fax speak for themselves.



with Fax/PM.

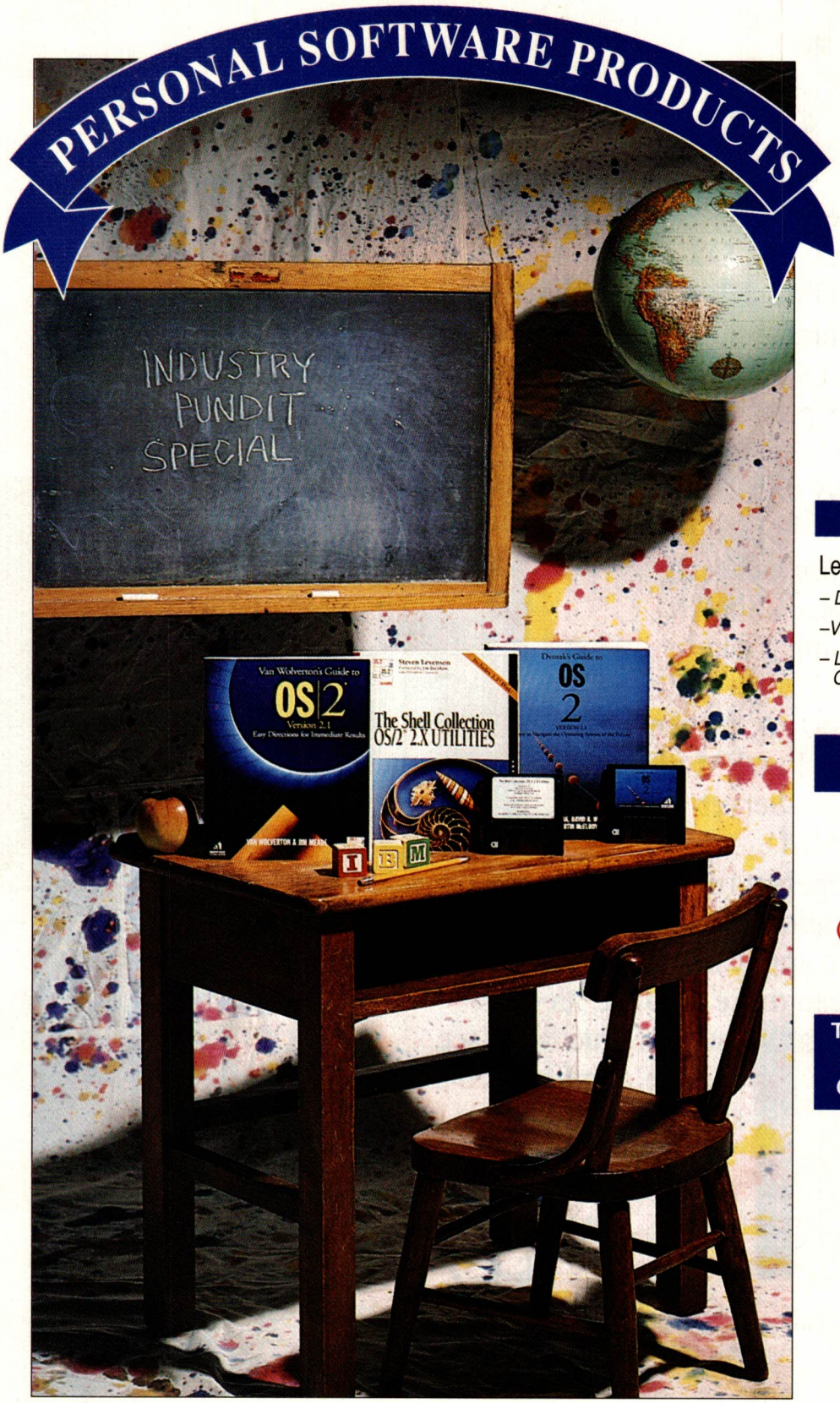
To order or to find out more about Fax/PM, call U.S.: 1-203-644-1708 / fax 1-203-648-9587
Europe: (33) 1 48 70 19 00 / fax (33) 1 48 70 27 29

Microformatic

Europe
2 rue Navoiseau
F-93100 Montreuil
France.

U.S.A.
P.O. Box 722
610 Niederwerfer Road
South Windsor, CT 06074

OS/2 and Workplace Shell are registered trademarks of IBM. Fax/PM is a registered trademark of Microformatic.


PERSONAL SOFTWARE PRODUCTS
INDUSTRY PUNDIT SPECIAL
Van Wolverton's Guide to OS/2 Version 2.1 Easy Directions for Immediate Results
The Shell Collection OS/2 2.X UTILITIES
Dvorak's Guide to OS/2 2

Operate At A Higher Level.™

SAVE OVER 20%

Learn OS/2 from the industry experts!

- *Dvorak's Guide to OS/2.....$45.00*
- *Van Wolverton's Guide to OS/2...16.00*
- *Levenson's The Shell Collection OS/2 2.X Utilities 29.95*

Regularly ~~*90.85*~~

Special Price Only $72.00!
Item No. 1295

For Easy Ordering
Call 1-800-342-6672
and Ask For Item No. 1295
(9 A.M. to Midnight *Mon.- Fri.*
9 A.M. to 9 P.M. *Sat., EST*)

To Receive Your Free Catalog of Additional OS/2 Products Call Toll-Free 1-800-342-6672

©1993 IBM Corp. All Rights Reserved. IBM and OS/2 are registered trademarks and Personal Software Products and "Operate At A Higher Level" are trademarks of International Business Machines Corporation. All other names and logos are (registered) trademarks of their respective companies.

IBM®

I.D. #J2

Reader Service No. 11

Basic and Telecom

CA-REALIZER, GOLDEN COMMPASS, AND SIO

BY BRIAN PROFFIT

CA-REALIZER 2.0
Computer Associates

It has long been said that people don't buy operating systems, they buy applications. To develop those applications, good tools are needed. When the tools are as raw as the operating system, large software vendors may have a lot of time and personnel to devote to training and development for new platforms, but smaller organizations, corporate MIS departments, and power users must wait until the tools mature. Many believe that one of the keys to unlocking a surge of new interest in OS/2 is a straightforward development aid such as Microsoft's Visual BASIC for Windows. CA-Realizer is just such a product.

Realizer's core is the same interpreted BASIC that has been the single most popular language for teaching programming since it was developed at Dartmouth University. Realizer builds on that core with features that allow you to develop GUI programs interactively and graphically—free from the typical iterative steps of writing code, writing graphic resources such as menus and dialog boxes, compiling the code, compiling the resources, and finally creating an executable—just to discover a bug and realize you must return to Step 1.

Interactive development

Realizer's FormDev tool makes development of forms and dialog boxes much more simple and straightforward—just point and click. Code connected to actions upon those forms is attached directly to the form. A separate edit window allows the entry of source code that isn't action specific. The ease of interactive development is what has excited people about using interpreters rather than compilers for years. You can literally test each new line of code as you write it. Then, when you have the program the way you want it, the Project Builder compiles it (complete with all resources) into an executable file that you can distribute without paying royalties. Well actually, as with most interpreted languages such as BASIC and REXX, the code is converted into "tokens," which are read by a run-time interpreter rather than a pure binary executable. The tokenized code isn't quite as fast as binary, but is a lot faster than interpreting the source code each time the program is run. For many programming needs, the relatively small run-time performance penalty is more than offset by the greatly shortened and simplified devel-

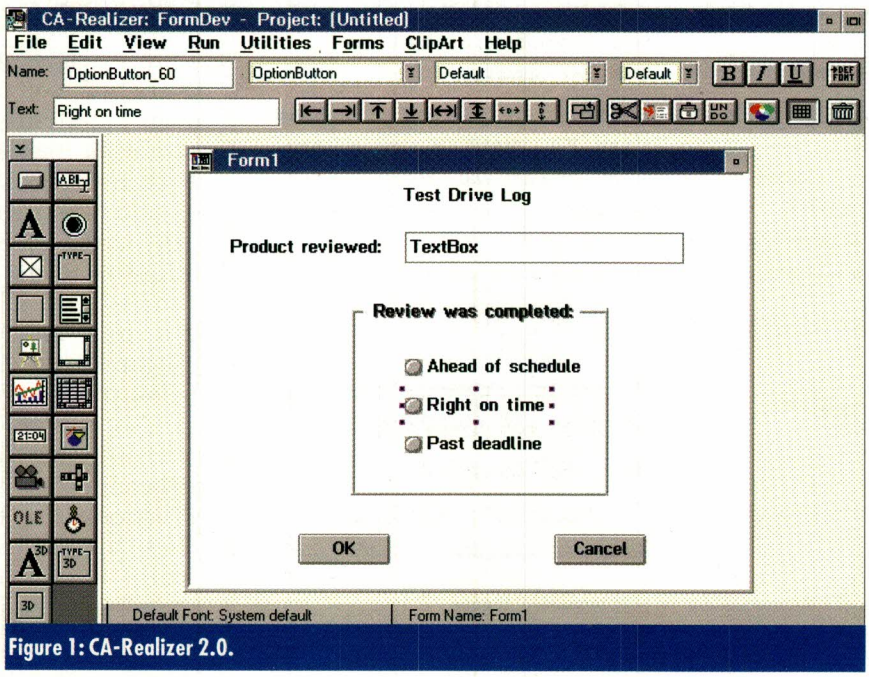


Figure 1: CA-Realizer 2.0.

opment cycle.

Getting started quickly

The documentation guides you through your first program smoothly, and a number of sample programs (and games) are included. There's nothing like looking at sample code to learn how to accomplish things. The Interface Sampler application gives a good look at the elements of a graphical Realizer program. Just don't try the animation piece. Instead of the promised animated bomb, you'll see Realizer itself bomb with a SYS3175.

Anyone who has slogged through resource compilers and message procedures just to display "Hello, world" in a window will be as thrilled as the newcomers to find that it is as simple as:

```
Print "Hello, world."
```

Realizer further simplifies development chores by including standard dialogs for many common operations such as opening files, with the familiar areas to select the file type, change directories, and so on. This concept of providing black-box functions to prevent having to reinvent the wheel with each program is also encouraged through Realizer's use of modules. Realizer programs cannot become DLLs (although they can call them), but individual Realizer modules and form libraries serve pretty much the same purpose, allowing individual debugged pieces to be reused in several different programs.

User interface glitches

When you first work in the Realizer edit window, you may be concerned. The font in the program windows is effectively illegible, at least at 1024 x 768. Don't start checking the menus for a way to change it. Just open the font palette, select the font and size you want, and drag it into the Realizer window. Easy, right? It's a good thing, because you'll have to do it every time you run Realizer unless you manually modify the *realizer.ini* file to change the default font. In fact, several font settings should have been made automatically in the *.ini* file. By the way, in addition to the *.ini* file, the runtime system is put in the \OS2 directory. That's well over half a megabyte of data that doesn't belong there—come on, CA.

Also, why do you have to go to the Form Characteristics dialog box to change a form's name and title? Every object on the form can have these attributes changed in the main FormDev window, and there's no reason why that ability shouldn't be available for the form

Pj2 CAD System®

Your Professional CAD for OS/2™

Some good reasons to try it :

Pj2 CAD System is a CAD package that gives you powerful drafting tools by exploiting the advanced features of OS/2. Pj2 manages an unlimited number of graphical entities, thus allowing you to create highly sophisticated technical drawings on your PC. Drawing with Pj2 is easy and comfortable. Due to its graphical interface that exploits the Workplace Shell, you need a very short time to become familiar with Pj2.

Pj2 CAD System provides more than 300 commands, 2D and 3D commands, 1023 layers, viewports, blocks, macros, an internal database, associative dimensioning, drawing exchange formats and customisation capabilities. By using Pj2, you can create a large variety of graphical entities, such as segments, circles, polygons, hatchings, texts, dimensions, blocks and splines. When managing hatchings, a powerful algorithm allows you to produce hatchings for very complex perimeters without trimming the border entities. Moreover Pj2 gives a complete and easy-to-use set of dimensioning functions that comply with ISO standards.

If you are a developer or a system integrator, Pj2 gives you an additional customisation tool, the **Pj2 Application Kit (PAK)**: a software library that allows you to create an application program and access the Pj2's functions from within it. Developing an application with the PAK is easy, as you need only standard programming tools.

For more information, call us today !

CadWare

Via Roma, 55
35027 Noventa Padovana (PD)
ITALY

Phone: +39-49-893-2551
Fax: +39-49-893-2561
CompuServe: 100136,3520

All Trademarks and Registered Trademarks are of their respective holders.

Reader Service No. 12

itself. And why use an arcane technique such as setting an object's number to one to associate it with the <Enter> key? Why not offer the ability to specify <Enter> from a list box?

They also left out some of the little niceties that can be useful in a development environment. For example, when indenting instructions to indicate the program structure visually, the editor should automatically indent each line to the same level as its predecessor.

Lots of nice features

Still, those are relatively small problems. Realizer has a number of features that are surprisingly mature for such a new product. You have all of the standard graphical controls to work with, such as scroll bars, check boxes, and so on. Realizer also includes 3D versions of these controls. Even better, you can create your own custom controls to liven up your programs. Instead of a check box, you might want to create a light switch to indicate that a feature is on or off. You can also include bitmaps on your forms to dress up their appearance. Realizer comes with a clip art library, and can import other bitmaps.

Realizer includes what CA calls "programmable application tools." These tools will greatly simplify many common programming tasks by automating the creation and processing of standard visual objects such as spreadsheets and charts, and you can get the data to fill these spreadsheets and charts from your existing databases. Realizer can import and export XBase files easily.

CA-RET is a report-writing product that is bundled with Realizer. The coupling between CA-Realizer and CA-RET is quite good. Still, it is obvious that CA-RET is a separate program. Information is passed from a CA-Realizer program to CA-RET via DDE. Nevertheless, CA-RET represents something that doesn't come with other products such as Visual Basic—a relatively integrated graphic report designer that can be called from the host language.

OS/2 exploitation

It is an unfortunate indication of Realizer's Windows legacy that it includes simple functions to allow you to turn the cursor into an hourglass and back, but none to allow you to start procedures in a separate thread. The only way to multitask is for the Realizer program to call a DLL written in another language to start a new thread. This limitation is serious enough to effectively disqualify Realizer from consideration for many development tasks. Computer Associates says that multitasking is being looked at for the

Introducing...
BakupWiz
OS/2 BakupWiz is the SCSI tape backup solution you have been looking for! Designed to exploit OS/2's multiple threading, BakupWiz gives you a quick and reliable method to completely back up your OS/2 system. HPFS and FAT file systems are supported and Extended Attributes, Long File Names, System files, and the Workplace Shell are backed up. You can even restore your entire OS/2 boot volume from tape!
Ease of use is another of OS/2 BakupWiz's strong points. A simple, character oriented interface allows for easy file selection on both backup and restore. No more complicated and awkward menu structures to navigate. Command line operation ability is another plus. OS/2 BakupWiz comes with support for most 1/4", 4mm (DAT), and 8mm tape devices. There is even a version of OS/2 BakupWiz that supports many of the automatic tape changer mechanisms. Any SCSI host adapter that has an ADD driver can be used with OS/2 BakupWiz.
PCX also works hard to keep you satisfied after the sale with outstanding customer support. Being a small and aggressive company means that we can respond to your needs that much quicker. When new tape drives become available, PCX adds support for them in a matter of weeks, not months.
OS/2 BakupWiz is priced at $149 (auto-changer version $399). Ask us about our competitive upgrade prices and hardware/software bundles! We offer a 30 day money back guarantee to protect you in case OS/2 BakupWiz does not work for you! Call our toll free number and order today!
SCSI Tape Backup/Restore
OS/2 Version
Available and Ready
for OS/2
FOR MORE INFORMATION OR TO ORDER CALL:
1-800-800-4PCX
PCX
3525 Del Mar Heights Road, Suite 313, San Diego, CA 92130
(619) 259-9797 • (619) 481-6474 FAX
MasterCard
VISA
Reader Service No. 13

next release. The sooner, the better.

I was pleasantly surprised, however, to see that you could program drag-and-drop into your applications. You can access all of the fonts you've installed in OS/2, and copy and paste from the system clipboard. The fact that you can write programs that use DDE to communicate with other programs is also significant.

Glee or Flee

Despite the fact that this release is labeled version 2.0, for OS/2 users, it is really version 1.0 since the first version only supported Windows. As with all products, the first release has some difficulties. The lack of multithreading is a serious drawback, and some user-interface anomalies do exist.

Still, Realizer is a remarkably easy development vehicle to use, particularly for power users looking to do some customized programming of their own. In addition, having Windows and OS/2 versions makes it easier for MIS people to develop programs that their users can take advantage of, regardless of their desktop platform. Even if the final program will be written in a different language, Realizer can be used for prototyping the user interface, and perhaps adding some scaffolding code.

Realizer represents a new type of tool; one that has long been awaited. Version 2.0 is a good start, and is useful just as it is, but Computer Associates should realize that it is just the start.

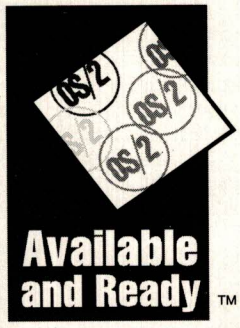
How Fast Can You Run?

Computers that run OS/2 vary widely in performance. Even with the same CPU, you are likely to see a large difference in overall speed. OS/2 systems can be tuned, but how do you know if the changes you make are helping or hurting?

BenchTech for OS/2 can tell you. This product is the most comprehensive set of benchmarks available, and they are designed specifically for OS/2 2.0 and 2.1.

Easy to use? BenchTech uses the now familiar notebook style interface, with full on-line help. Just point and click, and your tests are off and running.

If you are in the market for new computers to run OS/2, you need a tool to compare 32 bit OS/2 performance. BenchTech is the answer. BenchTech contains 25 tests in all, including CPU, memory, disk, video, and application benchmarks. Plus, it features a results logging facility and Rexx based macro language to automate testing.



for OS/2

The price for all this power? Just $79.95.
Call 1-800-598-1718.

SYNETIK SYSTEMS

Reader Service No. 14

GOLDEN COMMPASS 2.1
Creative Systems Programming

At up to $22.80 per hour for 9,600 or 14,400 bps connections, it's easy to run up charges of hundreds of dollars per month on CompuServe. Anyone who uses a plain terminal emulator and wades through CompuServe's menu structure and impossible user interface is probably not an OS/2 user. Chances are, they use Unix, stay with the command-line interface, and think **grep** is pretty intuitive. You absolutely must use a tool that handles the menus and allows you to read messages off-line. Golden CommPass 2.1 (GCP) offers that ability and more.

Most work is done off-line

The typical Golden CommPass session takes two or three passes through CompuServe. The first pass retrieves the messages, which you review and reply to off-line. The second pass sends your replies. To save time and money, you might not want to download every message in every section. Golden CommPass allows you to mark headers. With this technique, it scans the sections you've selected

and makes a list of the message topics. You browse that list off-line, indicating the topics that you'd like Golden CommPass to download on the second pass. A third pass would be used to send any replies to those messages. (By the way, Golden CommPass supports keyboard macros to simplify the entry of commonly used phrases in those replies.) One of the biggest benefits of Golden CommPass is its use of multiple threads to save you time during this process. Unlike any other CompuServe navigation tool, you can begin reading the messages downloaded from a forum immediately, even while other forums continue to be downloaded.

To simplify your scan through the subjects, Golden CommPass allows you to specify keywords of interest or disinterest. It can then sort the subjects so those with "include" keywords move to the top, while those with "exclude" keywords move to the bottom. With version 2.1, Golden CommPass has intelligent thread marking. It keeps track of the topics you select and, in future runs, premarks those topics for download.

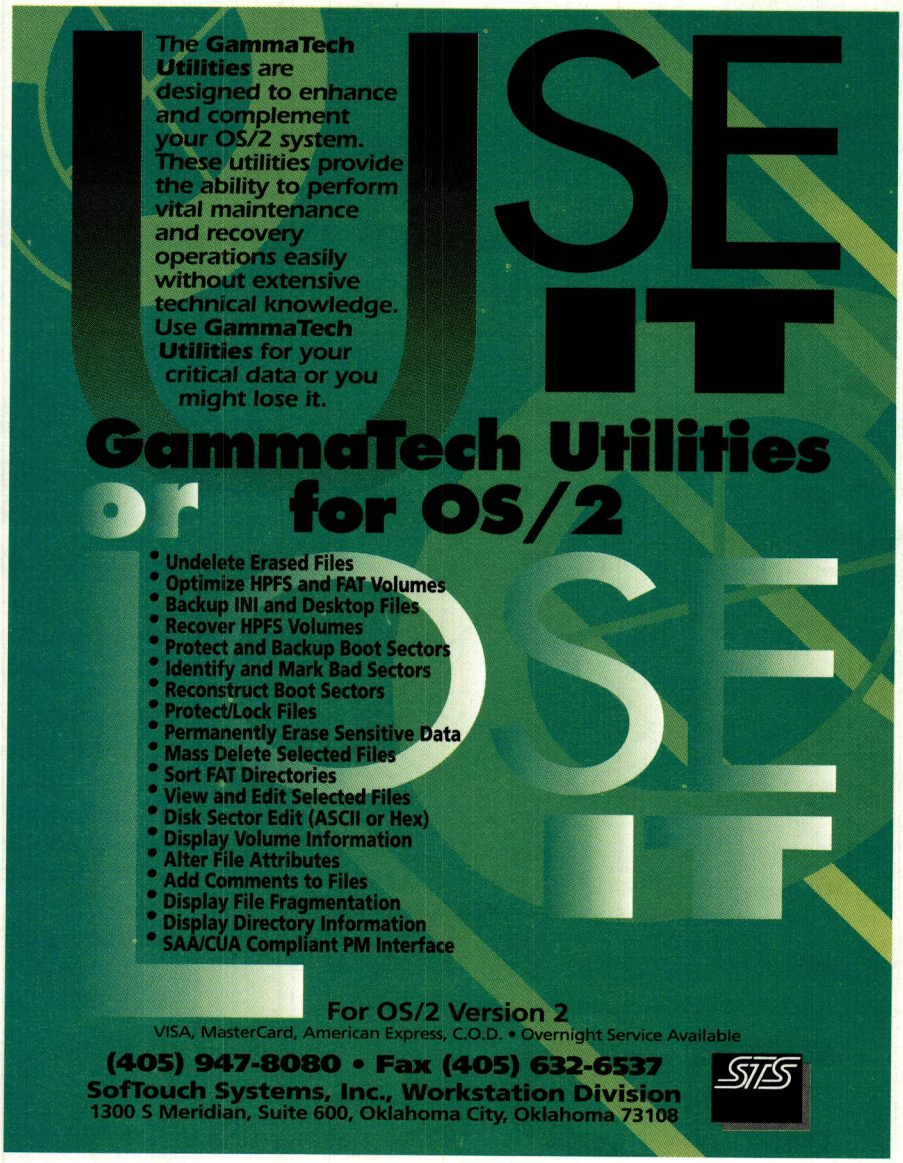
However, this ability is not a guarantee that you will only see the messages you want. A common problem on CompuServe is "topic drift," wherein a reply to a reply still has the same subject header, but no longer has anything to do with that topic. If you are entering a reply that is off the subject, Golden CommPass allows you to write a reply while changing the subject header.

As you're reading messages, you may be interrupted and have to stop. No problem, Golden CommPass can set a bookmark automatically in the message file, so that when you restart, the file will open to the last message read. You can also manually set bookmarks through a message file to make it easy to get back to messages of interest.

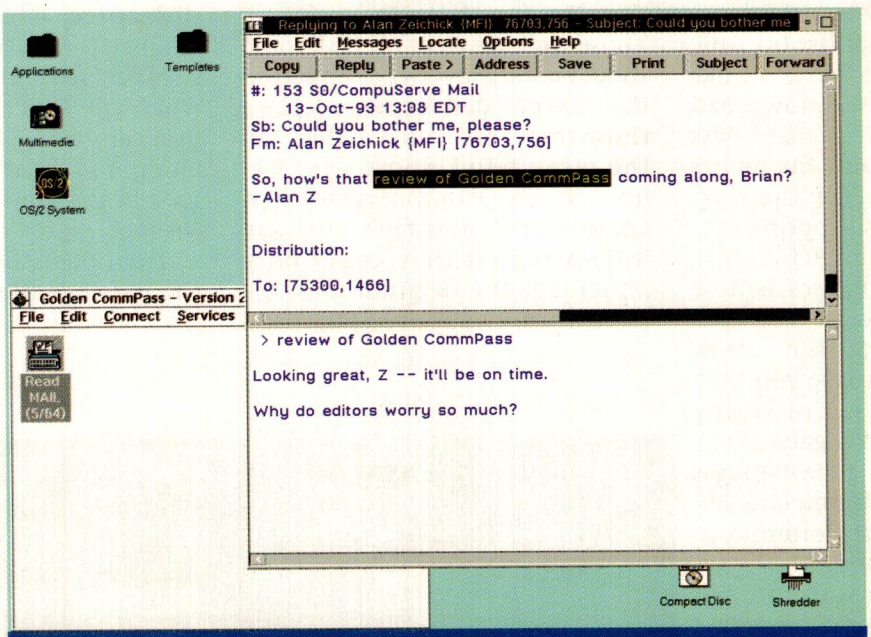
Tracing the threads

Those who are tight on disk space should use the overwrite option so that downloaded messages replace those that were stored earlier. On the other hand, those who frequently use CompuServe often come across messages that are interesting—if they could only remember the original message topic. Thus, if you have a little extra disk space, you should instruct Golden CommPass to append messages to the existing file. Then, when you find a cryptic message, you can use Golden CommPass' "Jump to parent" option to take a look at the message that inspired the reply.

This option, however, will cause the message files to continue to grow on your disk. With version 2.1,


USE IT
The GammaTech Utilities are designed to enhance and complement your OS/2 system. These utilities provide the ability to perform vital maintenance and recovery operations easily without extensive technical knowledge. Use GammaTech Utilities for your critical data or you might lose it.
GammaTech Utilities for OS/2
• Undelete Erased Files
• Optimize HPFS and FAT Volumes
• Backup INI and Desktop Files
• Recover HPFS Volumes
• Protect and Backup Boot Sectors
• Identify and Mark Bad Sectors
• Reconstruct Boot Sectors
• Protect/Lock Files
• Permanently Erase Sensitive Data
• Mass Delete Selected Files
• Sort FAT Directories
• View and Edit Selected Files
• Disk Sector Edit (ASCII or Hex)
• Display Volume Information
• Alter File Attributes
• Add Comments to Files
• Display File Fragmentation
• Display Directory Information
• SAA/CUA Compliant PM Interface
For OS/2 Version 2
VISA, MasterCard, American Express, C.O.D. • Overnight Service Available
(405) 947-8080 • Fax (405) 632-6537
SofTouch Systems, Inc., Workstation Division
1300 S Meridian, Suite 600, Oklahoma City, Oklahoma 73108
STS
Reader Service No. 15

Golden CommPass lets you "age" a message file, removing the oldest entries. You can either enter a specific message number, causing all lower numbers to be removed, or enter a cutoff date. All messages stamped by CIS before that date are removed. (It would be easier if Golden CommPass allowed you to specify the number of days you wished to keep and do the date arithmetic to remove the older messages.) If you're a pack rat, those older messages can be archived into a different file.


Replying to Alan Zeichick {MFI} 76703,756 - Subject: Could you bother me
File Edit Messages Locate Options Help
Copy Reply Paste > Address Save Print Subject Forward
#: 153 S0/CompuServe Mail
13-Oct-93 13:08 EDT
Sb: Could you bother me, please?
Fm: Alan Zeichick {MFI} [76703,756]
So, how's that review of Golden CommPass coming along, Brian?
-Alan Z
Distribution:
To: [75300,1466]
Golden CommPass - Version 2
File Edit Connect Services
> review of Golden CommPass
Looking great, Z -- it'll be on time.
Why do editors worry so much?
Applications
Templates
Multimedia
OS/2 System
Read Mail (5/64)
Compact Disc
Shredder
Figure 2: Golden CommPass 2.1

You can help lessen the need for others to use this feature by quoting short pieces of a message in your reply. When you are replying to a message, the window splits horizontally, with the original message at the top, and an area underneath for your reply. You can easily go to the source window and copy the few words required to set the stage. Rather than just doing a straight paste, Golden CommPass can automatically put quotation marks or the '>' symbol in front of the text to indicate to readers that the section is a quote

BONUS! 3000+ OS/2 Icons!

PERFORMANCE 2.1

fine A Tuning Kit for OS/2 2.1

- *Accredited by the IBM I.V. League!*
- *Recipient OS/2 Software Developer Award!*

100 Page Book and 30 REXX Programs

The Book - *Best Source of OS/2 Tuning Information!*
"Simple enough for the Novice with details that satisfy the Advanced user!"

The Software - *Simplifies tuning, Improves Performance!*
Utilities include: Optimizers to analyze and tune your system; Remove OS/2 features from fixed disk; Measure & report on tuning progress; Create an OS/2 boot diskette; Backup your WorkPlace Shell Desktop; Reset Icon Associations - Plus 3000+ OS/2 Format Icons

ONLY $29.95!

3.00 S&H
send Check or M.O. ($32.95)
VISA, MC & Discover Accepted
or call
(203) 658-1204 - Fax (203) 651-0354

CLEAR & SIMPLE, INC. - P.O. Box 130 - W. Simsbury, CT 06092

Reader Service No. 16

DeskMan/2™
The Desktop Manager for OS/2®

Now includes a WPS snapshot facility and VUEMan/2™

Install, configure, backup, restore, secure, and otherwise manage Workplace Shell™ objects, locally or remotely, all with access controls.

VUEMan/2, included with ***DeskMan/2,*** provides a powerful virtual desktop, including security, window management, screen savers, and more.

"I installed OS/2 2.1 golden code, and DeskMan/2 saved me at least 4 hours of tedious labor. I can't imagine being without it."
David Barnes
Senior staff member - IBM's OS/2 Executive Briefing Center

DeskMan/2 is fully CID enabled, and supported by LAD/2.

DevTech
Development Technologies, Inc.
Software Development & Technology Transfer
308 Springwood Road • Forest Acres, SC 29206-2113
(803) 790-9230

Available and Ready™
for LAN Server

Reader Service No. 17

from another message, as shown in Figure 2.

Exploiting GUI

The main window uses iconic cues to show the user where they are in the process. Forums that have unread messages show up as books, those that have headers to review and mark show up as clipboards, library catalogs show up as a cardfile, and so on. Each of these objects is opened with a double-click.

Golden CommPass' options are set via a standard Workplace Shell notebook. You can customize the font and colors here as well, although Golden CommPass should have used the OS/2 color and font palettes for this purpose.

Golden CommPass also provides a button bar, grouping a number of common commands at the top of the window, where they can be activated by a single click. The button bar is configurable, so if you use other commands more frequently, you can easily put them on the bar.

Not just messages

Golden CommPass includes features to help with conferences. You can input messages in a window, allowing you to edit them before sending. You can also open a second input window or upload a text file and send it as a message. Golden CommPass can capture conferences in a log file, and maintains a scroll-back buffer so you can review the last few pages of text.

Golden CommPass makes it easy for you to keep an up-to-date catalog of the libraries in the forums you frequent. After the initial download, it tracks the date so that subsequent catalog updates can use the age to pull down only the things that have been added or changed since the last update. You can browse through the catalog off-line, scanning by keyword, and mark the files of interest for later download.

Other goodies

One of CompuServe's features is a set of maps, kept up to date by the National Weather Service. Golden CommPass allows you to select these off-line, then download the GIF files automatically, presenting them via your favorite GIF viewer.

Golden CommPass's address book lets you keep the CompuServe IDs of those with whom you'd like to correspond. Try to remember who you have already added, because Golden CommPass lets you add duplicate entries to your heart's content without warning.

For more specialized processing needs, Golden CommPass allows you to create script files. You can also run it from a command line, so you could use a timer program to have it conduct a first pass automatically at 8:45 every morning, so

NEW! **PowerMap** *Version 2.1* NEW!

BUSINESS PROCESS RE-ENGINEERING FOR 0S/2 2.1.

Eliminates butcher paper and post-it notes by replacing traditional hand-drawn process maps with an automatically drawn process flowchart. With PowerMap the user does not have to draw or connect any of the flowchart objects. PowerMap supports the initial process documentation phase along with the re-engineering phase of process mapping.

Captures work and total time, person responsible, costs, transactions, and task iterations by process activity. All information is stored in a relational database (IBM DB2/2). Tasks can be exported into Lotus work-sheets, into MS Project, or transfered to the clipboard. Processes can be exported and imported between stand-alone PowerMap versions or stored in a LAN process repository and accessed with the LAN version of PowerMap.

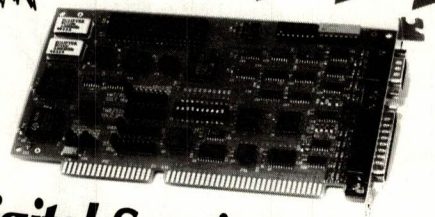
Flowcharts can be printed out on laser and color printers or on large industrial plotters such as the HP Designjet 6000. Printouts can be set to print out on one page or scaled up to 25 times their original size. With PowerMap you get more than just a flowchart. You can print time and costs analysis reports that provide you with the details behind each process activity.

For pricing inquiries and a list of client/server consultant services contact:

INVICTUS SYSTEMS CORPORATION
5268 LYNGATE COURT
BURKE, VA 22015
Phone (703) 503-8060 Fax (703) 503-8064

Reader Service No. 18

NEW 64,000 bps



Digital Services Adapter

- Available in ISA and PS/2® MCA versions
- Speeds to 64,000 bps, sync/async
- V.35 and RS-232 interfaces
- Connects to DSU/CSU, modem, or other DCE
- Runs advanced SNA connectivity software, including:
  - — OS/2 Communications Manager/2
  - — IBM® Personal Communications/3270
  - — IBM AS/400® PC Support

OS/2® READY

For more information call (800) 444-1982 or (512) 345-7791.

MICROGATE®

All trademarks are the property of their respective owners.

that when you arrive at your desk at 9:00, it is done and ready for your perusal.

Finally, Golden CommPass lets you keep a handle on your expenses by providing an up-to-the-minute estimate of your monthly bill. By tracking the number of minutes spent online and the connection speed, Golden CommPass can produce a fairly accurate picture of your cost.

Glee or Flee

Golden CommPass has some key benefits, including the user interface, the money you can save by reading your messages and browsing library catalogs off-line, and the time you save by being able to do other things during the download process, such as reading the messages from one forum while another is still being downloaded (while maintaining high-speed communication). Performance has been greatly improved over earlier versions. Taking all that into account, if you're a CompuServe user, Golden CommPass is one of those applications that can justify the purchase of OS/2 all by itself.

SIO VERSION 1.20

The Software Division

There is a long tradition of third-party vendors developing add-ons to an operating system to enhance its value. More rare, however, is a company developing an actual replacement for part of an operating system. Ray Gwinn saw just such a need in OS/2.

"I got a call from a friend telling me how great OS/2 2.0 was, but how lousy the serial communications were," Gwinn reports. "So I got a copy and started fooling around with it, and it was pretty bad. I got on CompuServe and sent a few messages to IBM, and basically what they said was that it couldn't be done any better. I took that statement as a challenge."

Sio.sys is a shareware replacement for the *com.sys* device driver in OS/2, and its companion *vsio.sys* replaces *vcom.sys* for DOS-to-Windows communications sessions. The emphasis is entirely on speed. In its simplest terms, SIO requires fewer instructions for each COM interrupt than the native OS/2 driver.

In tests of long downloads at 14.4 kbps (using a 66MHz 486), I found a striking improvement. *Sio.sys* averaged 1,650 cps throughput vs. 1,250 cps for OS/2's native device driver. Equally significant was the improvement in speed of other applications while these transfers took place. SIO cut response time in half for activities such as moving text within a DeScribe document while background communication took place. Systems with asynchronous chips and an internal buffer, such as the 16550, should see even greater improvements.

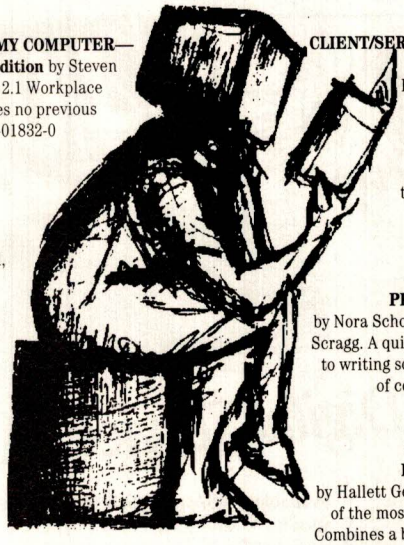
VNR KNOWS OS/2®

USERS

NOW THAT I HAVE OS/2 2.1 ON MY COMPUTER—WHAT DO I DO NEXT?, Second Edition by Steven Levenson. Explains IBM's new 0S/2 2.1 Workplace Shell. Perfect for beginners: assumes no previous experience with OS/2. $22.95 0-442-01832-0

THE OS/2 2.0 HANDBOOK: Applications, Integration, and Optimization by William Zack. Helps users of OS/2 get up to speed with the full power, potential, and extended services offered by OS/2 2.0. $34.95 0-442-01234-9

USING WORKPLACE OS/2: The Power User's Guide to IBM OS/2 Version 2.1 by Lori Brown and Jeff Howard. Exclusive tips from the designer of Workplace Shell. Covers Windows 3.1 and provides abundant support for multimedia applications. $24.95 with disk. 0-442-01590-9



DEVELOPERS

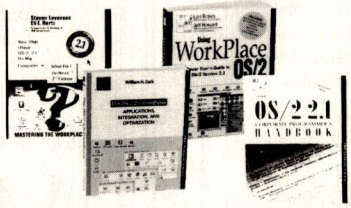
CLIENT/SERVER PROGRAMMING WITH OS/2 2.1, Third Edition by Robert Orfali & Daniel Harkey. 0S/2 MONTHLY called the 2nd Edition *"The OS/2 Book of the Year!"* Others said individual chapters were, by themselves, *"worth the price of the book."* They're right! $39.95 0-442-01833-9

02/2 2.1 CORPORATE PROGRAMMER'S HANDBOOK by Nora Scholin, Martin Sullivan and Robin Scragg. A quick and easy modular approach to writing software programs. Gives plenty of code examples $39.95 with disk. 0-442-01598-4

OS/2 2.1 REXX HANDBOOK: Basics, Applications and Tips by Hallett German. A one-stop guide to one of the most popular command languages. Combines a basic tutorial with fast answers to all REXX questions. $29.95 0-442-01734-0

Van Nostrand Reinhold
115 Fifth Avenue New York, New York 10003

VNR *To place an order, or for a complete listing of VNR titles, call 1-800-544-0550 (Dept. Z 1596) or GO VNR on the CompuServe® Network. To order from IBM call 1-800-568-6294.*



OS/2® is a registered trademark of IBM Corporation.

Reader Service No. 19

The absolute focus on performance means that when trade-offs were required, compatibility was lost. While I was able to use SIO flawlessly with standard communications programs, such as Golden CommPass, Terminal Emulator/2, Procomm Plus for Windows, and QModem, I had problems with fax software. Fax/PM, for example, couldn't get past the bottom of the first page without disconnecting the line with a communications error, even though it works fine on the same system with OS/2's *com.sys* driver.

Gwinn says that all such problems are because SIO is too fast. "Whenever you get an error at page transition like that, it's a flow-control problem. SIO's speed causes it to overrun the buffer, while *com.sys* isn't fast enough to do that." Perhaps, but specifically setting the flow-control parameters in the modem initialization string didn't fix the problem.

Glee or Flee

The registration fee for SIO is $25 for individuals with up to four asynchronous ports. Those accessing on-line services that charge for connect time will be able to recoup that fee very quickly with the increased throughput at the same connect speed. They'll also appreciate their improved ability to run other programs at the same time. Just keep in mind that you may have to reboot with OS/2's device driver for fax software.

Brian Proffit has been in the computing industry for 20 years. He was part of IBM's OS/2 team, left IBM to become the director of PC Week's Corporate Labs, and is now the President of Visionary Research. Brian is the author of two books on OS/2: OS/2 Application Development Tools, *and* OS/2 Inside & Out. *He has written for several publications, including* IBM Personal Systems Developer *and* PC Week. *He can be contacted via CompuServe at 75300,1466, or Internet 75300.1466 @compuserve.com.*

RESOURCES:

CA-Realizer ($99)
Computer Associates, International
1 Computer Associates Plaza
Islandia, NY 11788-9820
(800) 225-5224;(516) 342-5224
fax: (516) 342-5734
READER SERVICE NO. 151

Creative Systems Programming($99)
Post Office Box 961
Mount Laurel, NJ 08054
(609) 234-1500, fax (609) 234-1920
CompuServe GCP SUPPORT
Internet 71511.151@compuserve.com
READER SERVICE NO. 152

SIO ($25)
The Software Division
12469 Cavalier Drive
Woodbridge, CA 22192
CompuServe: 71154,575
fax: (703) 494-0595
READER SERVICE NO.153

Now available for immediate shipment

DeScribe 4.0 rev e

The Leading Word Processor for OS/2 & NT

SE	Subscription Edition *(Includes upgrade to 4.1, plus all interim releases)*	$310.00
CU	Competitive Upgrade *(For users of any Windows or OS/2 Word Processor)*	$139.00
EVP-90	Eval-U-Pack *(Full product, full documentation, 90-day lifespan)*	$39.00
EVP-UG	Eval-U-Pack Upgrade *(Eval-U-Pack upgrade — equivalent to competitive upgrade)*	$117.00

Guaranteed Same Day Shipping
All prices include UPS Ground shipping.
Add $7.00 for Airborne 2 Day Service.
CREDIT CARDS ONLY

To order call: Bayshore 9am-5 pm EST

1-813-732-5500

Reader Service No. 20

OS2TREE™

See your entire system graphically at a glance!
"What XTREE GOLD is to DOS and More!
And What Norton Commander Missed"

- Completely programmable: every function/key can be customized!
- Display your tree structure for all system and LAN disks concurrently!
- Manipulate your files, directories, entire disks and/or entire system!
- HPFS fully supported
- Pop-up list of files for any directory
- Edit/browse file(s) using any EDITOR or PROGRAM!
- Extensive FILE Search and Tree directory search capabilities make locating files and/or data easy.
- Upload/download files between mainframe and PC
- Secure delete (sensitive files wiped clean)

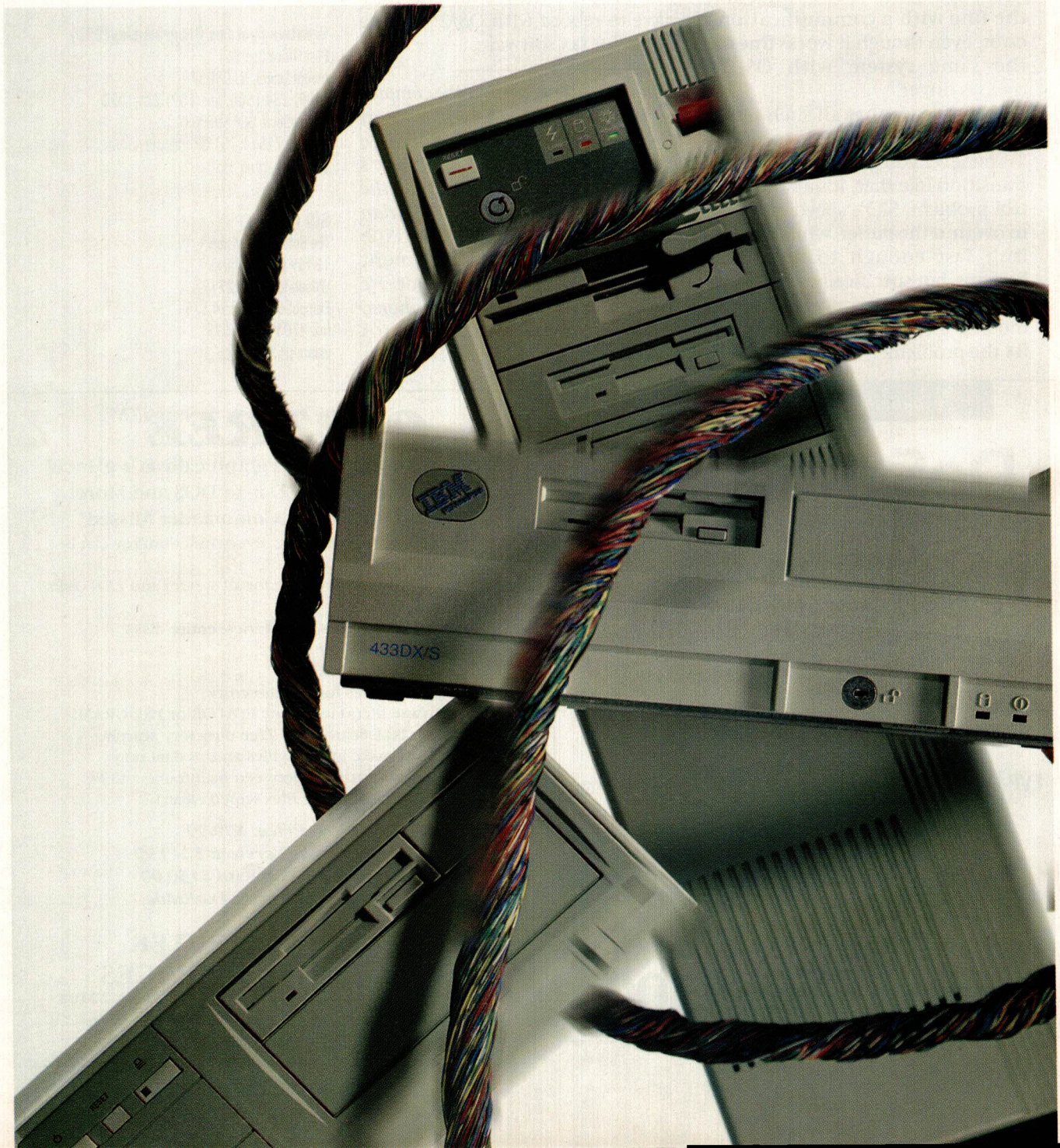
Intro Price: $79.99
Professional Version: $249.99
Limited time special $150.00
Network Licenses Available

LEVINE COMPUTER CONSULTING SERVICES
7640 Provincial Dr., Suite 213, McLean, VA 22102
Orders only (800) 383-9495
FAX/Inquiries/HelpLine (703) 790-1660

Reader Service No. 21

Everything you need to know to install and use NetWare Client 2.01 for OS/2

by Bob Panza



NetWare made Easy

Since the initial release of OS/2, the operating system has transformed many times. OS/2 1.1, 1.2, 1.3, and 2.0 led to the latest and greatest—OS/2 2.1. Like evolving butterflies emerging from their cocoons over and over again, the new OS/2 versions got better with every transformation. OS/2 2.1 is a milestone of stability and functionality.

Let's take a journey through the new NetWare Client 2.01 for OS/2, looking at its features and the installation process, with a particular emphasis on the NetWare's various

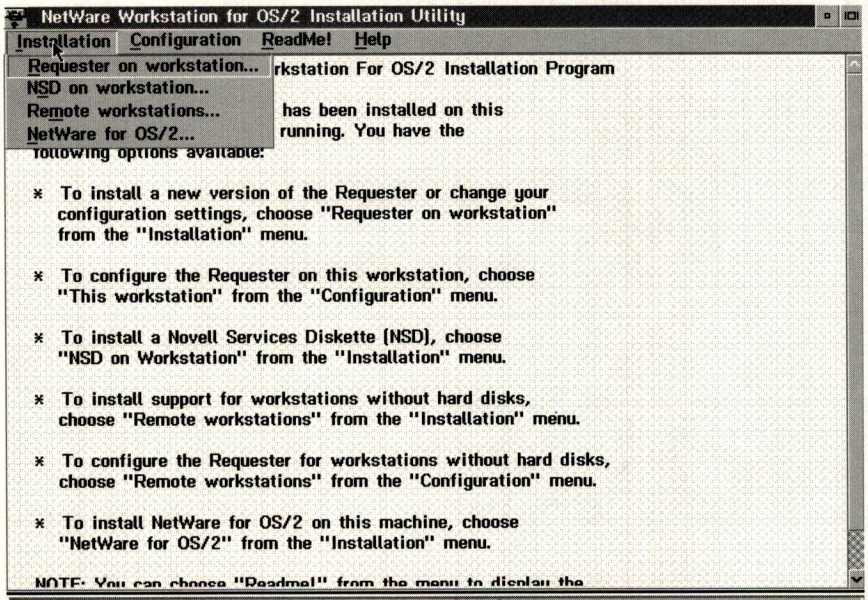

NetWare Workstation for OS/2 Installation Utility
Installation Configuration ReadMe! Help
Requester on workstation...
NSD on workstation...
Remote workstations...
NetWare for OS/2...
rkstation For OS/2 Installation Program
has been installed on this
running. You have the
following options available:
* To install a new version of the Requester or change your configuration settings, choose "Requester on workstation" from the "Installation" menu.
* To configure the Requester on this workstation, choose "This workstation" from the "Configuration" menu.
* To install a Novell Services Diskette (NSD), choose "NSD on Workstation" from the "Installation" menu.
* To install support for workstations without hard disks, choose "Remote workstations" from the "Installation" menu.
* To configure the Requester for workstations without hard disks, choose "Remote workstations" from the "Configuration" menu.
* To install NetWare for OS/2 on this machine, choose "NetWare for OS/2" from the "Installation" menu.
Install the NetWare Requester for OS/2 on this workstation

Figure 1: The NetWare Client for OS/2 Installation Utility provides plenty of information to guide the installer through software installation and configuration. Application of NSDs via the utility is a nice touch. Install also covers the NetWare for OS/2 file-server product.

configuration files. We'll assume that you have some knowledge of networking in general. If you're familiar with the specifics of any of the varieties of Novell NetWare, you'll find NetWare Client easy to adapt to.

Metamorphoses

Throughout the course of OS/2 evolution, which began in 1987, many sets of corrective service diskettes (CSDs) were applied to remedy bugs and design-related problems. The quantity of cumulative CSD floppies must have numbered several hundred over time. Those CSDs brought additional updates, further altering the software between released versions. The creation of OS/2 obviously turned out to be a bigger and more complex task than the original planners imagined. The miscalculation is understandable. OS/2 was a new kind of operating system, characterized by greater capability and complexity than DOS but more user friendly and less complicated than UNIX.

Novell's NetWare Requester for OS/2 seemed to be forever chasing the transformations of OS/2. Connectivity with the Novell world is especially important for broad-based appeal to the vast community of NetWare end users. Like OS/2, the NetWare Requester has travelled a long road through many releases before version 2.01. The parallel holds for software fixes as well, with Novell issuing Novell Service Diskettes (NSDs) to remedy the numerous bugs that all new software is fated to have.

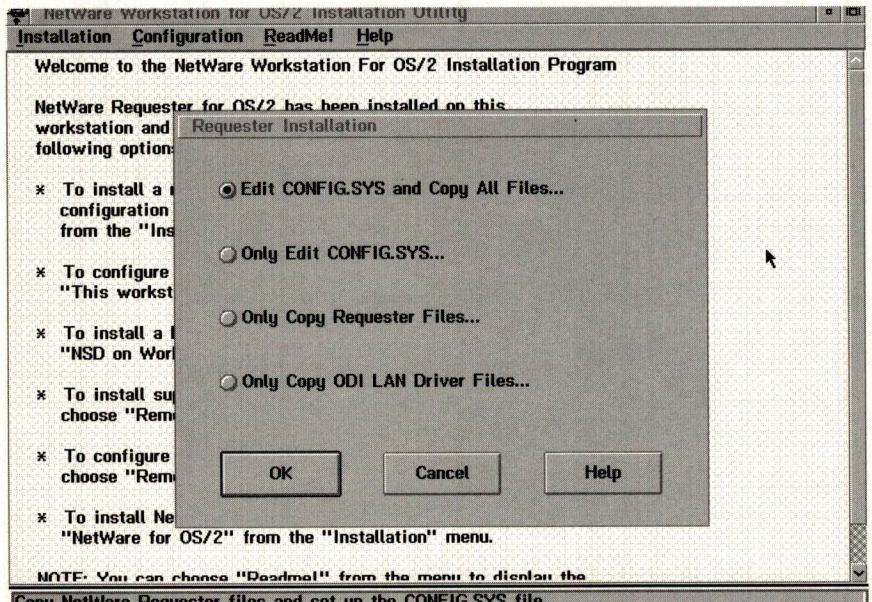

NetWare Workstation for OS/2 Installation Utility
Installation Configuration ReadMe! Help
Welcome to the NetWare Workstation For OS/2 Installation Program
Requester Installation
Edit CONFIG.SYS and Copy All Files...
Only Edit CONFIG.SYS...
Only Copy Requester Files...
Only Copy ODI LAN Driver Files...
OK
Cancel
Help
"NetWare for OS/2" from the "Installation" menu.
Copy NetWare Requester files and set up the CONFIG.SYS file

Figure 2: Full and partial software installation options are provided as well as *config.sys* editing. The process can be run over and over again without doing damage. Afterwards, the utility remains on hand in the Novell Icon View.

More Change

Even the name of version 2.01 changed from NetWare Requester for OS/2 to NetWare Workstation for OS/2 to NetWare Client for OS/2. However, the term has not yet been altered in the software and documentation details, so many references to "requester" remain. NetWare Requester, rather than NetWare Client, is still an option in the NetWare Open Data-Link Interface (ODI) configuration file *net.cfg*, as we will see later on. NetWare Client 2.01 for OS/2 is the version we installed on OS/2. The combination brings an incredible variety of concurrent possibilities to the OS/2 environment.

Novell's

NETWARE REQUESTER FOR OS/2 SEEMED TO BE FOREVER CHASING THE OPERATING SYSTEM'S TRANSFORMATIONS

The workstation can simultaneously run a combination of OS/2, virtual DOS, virtual Windows, and real DOS kernel sessions. It is also possible to have sessions running different versions of DOS. NetWare 3.11 DOS NETX and NetWare 4.x DOS workstation Virtual Loadable Modules (VLMs) are both supported, although some limitations exist on NetWare 4.x functionality for DOS and Windows. Global or private options can be configured across the board or session-by-session for seven possible session types: OS/2, private virtual DOS, global virtual DOS, private virtual Windows, global virtual Windows, private sessions booted from a real DOS kernel and running NetWare

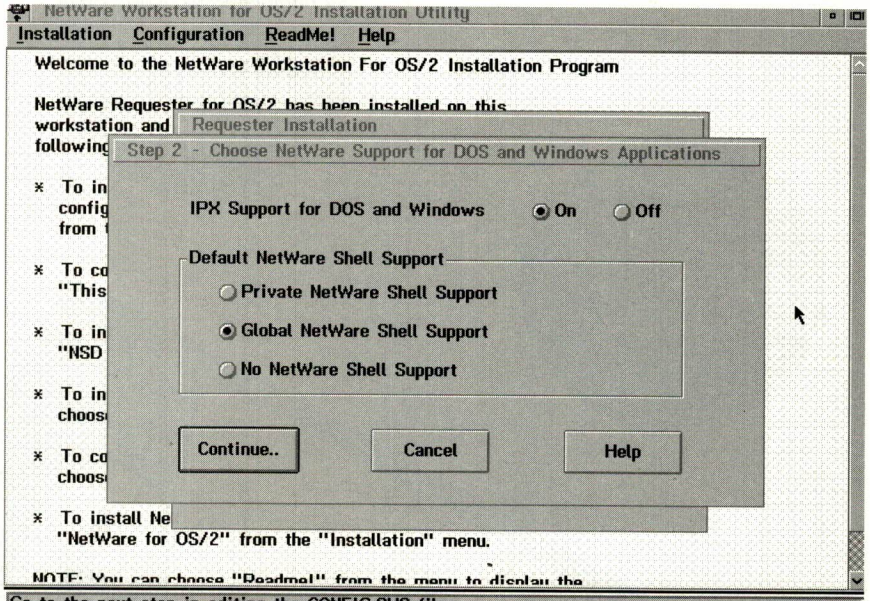

NetWare Workstation for OS/2 Installation Utility
Installation Configuration ReadMe! Help
Welcome to the NetWare Workstation For OS/2 Installation Program
Requester Installation
Step 2 - Choose NetWare Support for DOS and Windows Applications
IPX Support for DOS and Windows
On
Off
Default NetWare Shell Support
Private NetWare Shell Support
Global NetWare Shell Support
No NetWare Shell Support
Continue..
Cancel
Help
"NetWare for OS/2" from the "Installation" menu.
Go to the next step in editing the CONFIG.SYS file

Figure 3: IPX support for DOS and Windows brings a "better Windows than Windows" to the network. Global NetWare shell support is the best way to start out. Even with the global default in place, private sessions can be set up individually.

Listing 1: NetWare requester statements in *config.sys*.

```
REM —— NetWare Requester statements BEGIN ——
SET NWLANGUAGE=ENGLISH
DEVICE=C:\NETWARE\LSL.SYS
RUN=C:\NETWARE\DDAEMON.EXE
DEVICE=C:\NETWARE\TOKEN.SYS
DEVICE=C:\NETWARE\ROUTE.SYS
DEVICE=C:\NETWARE\IPX.SYS
DEVICE=C:\NETWARE\SPX.SYS
RUN=C:\NETWARE\SPDAEMON.EXE
DEVICE=C:\NETWARE\NMPIPE.SYS
REM DEVICE=C:\NETWARE\NPSERVER.SYS
RUN=C:\NETWARE\NPDAEMON.EXE
DEVICE=C:\NETWARE\NWREQ.SYS
IFS=C:\NETWARE\NWIFS.IFS
RUN=C:\NETWARE\NWDAEMON.EXE
DEVICE=C:\NETWARE\NETBIOS.SYS
RUN=C:\NETWARE\NBDAEMON.EXE
DEVICE=C:\NETWARE\VIPX.SYS
DEVICE=C:\NETWARE\VSHELL.SYS GLOBAL
REM —— NetWare Requester statements END ——
```

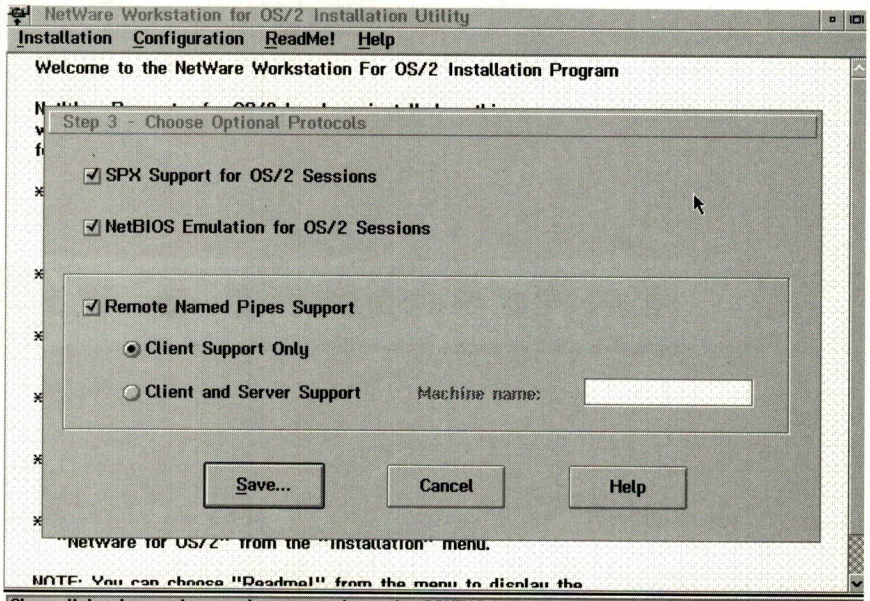

NetWare Workstation for OS/2 Installation Utility
Installation Configuration ReadMe! Help
Welcome to the NetWare Workstation For OS/2 Installation Program
Step 3 - Choose Optional Protocols
SPX Support for OS/2 Sessions
NetBIOS Emulation for OS/2 Sessions
Remote Named Pipes Support
Client Support Only
Client and Server Support
Machine name:
Save...
Cancel
Help
Close dialog box and save changes made to the CONFIG.SYS file

Figure 4: Optional protocols reflect the Novell tradition of SPX/IPX, NetBIOS emulation/IPX, and Named Pipes/SPX. Named Pipes client and server support and machine name creates the Named Pipes server daemon platform for a Named Pipes client/server backend. Install will promptly update the *config.sys* file based on the selections.

Pose your toughest questions to more than 100 vendors of OS/2 products.

Choose from more than 100 classes taught by independent experts.

Network with thousands of other OS/2 users and managers.

CONFERENCE & EXHIBITION

July 19-22, 1994

Santa Clara Convention Center

Santa Clara, California

Announcing the 1st Annual OS/2 World Conference & Exhibition

Are you tired of hearing *only* about Windows®? Do you want more support in your day-to-day use of OS/2? Is your company struggling to integrate OS/2 into its enterprise computing strategy? *If you answered "yes" to any of these questions, then the* OS/2 World Conference and Exhibition *is a can't miss event for you.*

OS/2 is taking the world by storm, winning plaudits from critics, reviewers, and users as the best 32-bit operating system for the desktop. The OS/2 World Conference and Exhibition offers you the lectures, workshops, tutorials, and exhibits to keep your finger on the pulse of OS/2.

Get the Answers to Your Toughest Questions. Get the Most Out of OS/2.

Over 100 lectures, workshops, and tutorials allow you to create a custom-made technical program. Tracks like Client/Server Computing, Enterprise Area Networking, Systems Administration, Multimedia, OS/2 Power Computing, and Corporate Software Development will keep *your program* focused on *your needs.*

Whether you're interested in finding out more about networking OS/2, using OS/2 on the server, customizing the Workplace Shell, programming in REXX, or using OS/2 in heterogeneous environments, the OS/2 Conference and Exhibition has what you want.

Here Are Some of the Classes Being Offered at OS/2 World

- Debugging OS/2 Printing Problems
- Auditing and Evaluating your Network's Security
- Optimizing Distributed Network Performance
- Databases under OS/2
- Migrating applications from 32-bit UNIX
- Object-oriented design for OS/2
- Designing robust client/server applications
- Moving to the SOM and DSOM models
- Optimizing distributed database performance
- Working with the OS/2 X Window Server
- OS/2 connectivity with DEC VAX systems
- Optimizing LAN Server networks for OS/2 workstations
- Implementing enterprise imaging solutions under OS/2
- Taking advantage of symmetric multiprocessing with OS/2
- LAN Server disaster planning & recovery
- E-mail under OS/2: from cc:Mail to Internet SNMP
- Benchmarking LANs: Finding the faster and most robust solution
- Remote network administration using OS/2 system services

The World's Largest Product Exhibition Dedicated to OS/2

Kick the tires and check under the hood for the hardware and software that can make your system scream. Over 100 vendors will be displaying the latest tools and technologies dedicated to OS/2.

Leading industry suppliers will be showcasing applications software, communications hardware and software, databases, network solutions, utilities, multimedia tools, and more. They will let you test out the newest products and pose your toughest questions to the people who have the answers.

See the Future of OS/2 — Today!

Running parallel to the technical program will be dozens of presentations by key visionaries at IBM and major OS/2 hardware and software providers.

Industry-Wide Sponsorship Guarantees a Top-Quality Event

Produced and owned by Miller Freeman, Inc., the third largest tradeshow producer in North America, the OS/2 World Conference and Exhibition is presented in cooperation with the IBM Corporation and sponsored by *OS/2 Magazine, OS/2 Developer, DBMS, Database Programming and Design, LAN Magazine, STACKS: The Network Journal, Software Development and Dr. Dobb's Journal.*

Phone fax, or mail today for more information on the OS/2 World Conference and Exhibition.

YES! Please send me info on: ☐ Attending ☐ Exhibiting

NAME

TITLE PHONE

COMPANY FAX

ADDRESS

CITY STATE/PROV. ZIP

OS/2 World Conference and Exhibition Attn: JulieAnn Lee
600 Harrison Street, 4th Floor, San Francisco, CA 94107-9603
Phone: (415) 905-2354 Fax: (415) 905-2220 OS22

Reader Service No. 22

All popular protocol stacks can be deployed for full interoperability across an incredible range of system platforms.

4.0 DOS workstation VLMs, and global sessions booted from a real DOS kernel running NETX.

Compatibility covers NetWare 3.1x as well as NetWare 4.x servers, again with a few caveats for DOS and Windows. Initialized software can mix ODI with Network-Driver Interface Specification (NDIS) and IBM Extended Services architectures (via *odinsup.sys* and *lansup.sys* drivers). As a result, all popular protocol stacks can be deployed for full interoperability across an incredible range of system platforms. Full compatibility has been achieved with IBM LAN Services down to IBM's NetBIOS/LLC and Novell's NetBIOS/IPX side by side. Most amazing of all, the workstation can run NetWare for OS/2 as a nondedicated NetWare file server with the NetWare Client for OS/2. The file server and workstation can even share the same NIC. The configuration possibilities go on and on.

To get the NetWare Client up and running on OS/2, the software must be procured, installed, and configured. Configuration involves *config.sys* and *net.cfg* entries to unlock workstation hardware, OS/2 communication interfaces, communication protocols, and so forth. In addition, configuration after initial installation is key for tranform-

Listing 2: *net.cfg*, the NetWare configuration program.

```
DAEMON CONFIGURATION
   MESSAGE TIMEOUT no timeout if not present in NET.CFG
;Controls the length of time network related pop-up and
;error related messages stay displayed on the screen.
DISPLAYHARDERRORS yes (hard error messages display)
;Displays hard errors and requests a user response.
LINK DRIVER driver name
   DMA set by driver
   FRAME set by driver
   INT set by driver
   MEM set by driver
   NODE ADDRESS adapter address
   PORT set by driver
   PROTOCOL ipx, id and frame type are set by driver
   SLOT number
;Specifies the LAN driver configuration for a single NIC.
LINK SUPPORT
   BUFFERS 20,1514 (20 buffers @ 1514 bytes each)
;Tunes size and number of requester communication buffers.
NAMED PIPES
   CLIENT SESSIONS 16
   SERVER SESSIONS 32
   SERVICE THREADS 3
;Allocates resources to Named Pipes sessions.
NETWARE NETBIOS
   ABORT TIMEOUT 30,000 milliseconds
   INTERNET on
   BROADCAST COUNT with internet on,  4 queries;
                  with internet off, 2 queries
   BROADCAST DELAY with internet on,  2,000 milliseconds;
                  with internet off, 1,000 milliseconds
   COMMANDS 32
   LISTEN TIMEOUT 6,000 milliseconds
   NAMES 24
   RETRY COUNT 20
   RETRY DELAY 500 milliseconds
   SESSIONS 16
   VERIFY TIMEOUT 3,000 milliseconds
;Allocates resources for NetBIOS names and sessions.
NETWARE REQUESTER
   CACHE BUFFERS 8
   DIRECTORY SERVICES OFF on=line not present in NET.CFG.
   LARGE INTERNET PACKETS OFF on=line not present in
NET.CFG.
   NAME CONTEXT root of the tree
   NONDED SERVER no sharing of NIC with NetWare for OS/2
   PACKET BURST OFF on
   PREFERRED SERVER none
   PREFERRED TREE root
   REQUEST RETRIES 10
   SESSIONS 8
   SIGNATURE LEVEL 1
;Controls requests between workstation and file server.
PROTOCOL ODINSUP
   BIND driver of first NIC located
;Allows NDIS stacks to communicate with ODI drivers.
```

Preparation for the OS/2 odyssey to NetWare begins with procurement of the NetWare Client 2.01 for OS/2 and an examination of the software before installation.

ing the many potentials of the IBM-Novell OS/2 environment into actualities at the whim of the workstation user.

Preparing for NetWare

Preparation for the OS/2 odyssey to NetWare begins with procurement of the NetWare Client 2.01 for OS/2 and an examination of the software before installation. The software package and documentation can be purchased from Novell for $30 or downloaded from NetWire.

After installing IBM OS/2 2.1 on the "guinea pig" workstation, we downloaded three self-extracting compressed files from NetWire: *wsos21.exe*, *wsos22.exe*, and *wsos2d.exe*. Each file explodes for creation of separate floppies, which we respectively labeled WSOS2_1, WSOS2_2, and WSDRV_1. (It is best to explode the files on a hard disk and then XCOPY them to create the WSOS2 diskettes.) Most of the exploded files reside in subdirectories with many OS/2 files stored in packed format.

What does each floppy contain? WSOS2_1 has an installation program, *install.exe*, and an unpack program, *nwunpack.exe*, in the root directory. *\login*, *\nls*, *\windows*, *\dos.np*, and *\sql* directories each hold their respective files. *\os2* and *\psfonts* are also included as empty directories (without any files), most likely to build a set directory structure on the workstation. A few utility files (*cx.exe*, *login.exe*, *map.exe*, and *nlist.exe*) reside packed in *\login*. In addition, *\login* holds various unicode files for language support of NetWare utilities. The unicode files are identified by "uni" as part of their file names. National Language Support (English) and OS/2 NetWare Tools are stored below *\nls*.

The Named Pipes Extender, *dosnp.exe*, which enables DOS workstations to communicate via Named Pipes with products such as OS/2-based Microsoft SQL Server, resides in *\dos.np*. *Netapi.dll* and *netoem.dll*, for SQL Server clients running Microsoft Windows, are found in the *\sql* subdirectory. The tradition of bundling those key DOS and Windows workstation files with NetWare Client for OS/2 continues. They must be manually copied from WSOS2_1 onto the DOS or Windows workstations that require them. The Named Pipes *netapi.dll* in *\sql* should not be confused with the OS/2 *netapi.dll* in *\requestr* or the WIN-OS/2 *netapi.dll* in \windows on WSOS2_1. Each *netapi* serves a different purpose.

WSOS2_2 stores a readme.1st file and a *\requestr* subdirectory containing the OS/2 workstation files, such as *lsl.sys*, *ipx.sys*, *odinsup.sys*, *nwreq.sys*, and *vshell.sys*. The *readme* file provides valuable configuration-related information for the installer. In *\os2*, floppy WSDRV_1 holds the LAN drivers for accessing different network

```
PROTOCOL STACK IPX
    BIND 1st ODI driver in config.sys
    ROUTER MEM 450 bytes
    SOCKETS 64
;Tunes IPX communication between apps and drivers.
PROTOCOL STACK SPX
    ABORT TIMEOUT 30,000 milliseconds
    LISTEN TIMEOUT 6,000 milliseconds
    RETRY COUNT 20
    SEND TIMEOUT in milliseconds, determined dynamically by
SPX
    SESSIONS 16
    VERIFY TIMEOUT 3,000 milliseconds
;Tunes SPX network connections.
NETWARE FOR OS/2
    PERFORMANCE TUNING 7 (timeslicing, on a scale of 1 to 10)
    REMOVE SERVER MEMORY (not released on DOWN)
    SERVER MEMORY 8 megabytes (minimum)
;Sets NetWare for OS/2 memory and performance features.
PROTOCOL ROUTE
    SOURCE ROUTE (no def gbr or mbr) nodes 16 board 1
;Configures source routing broadcasts and table entries. The
;default is the absence of broadcast parms def, gbr, and mbr.
VIRTUAL MLID for LAN Sharing
    VIRTUAL BOARD SIZE 1514
;Tunes LANSHARE.SYS buffer size for NIC sharing between the
;NetWare Client for OS/2 and NetWare for OS/2.
```

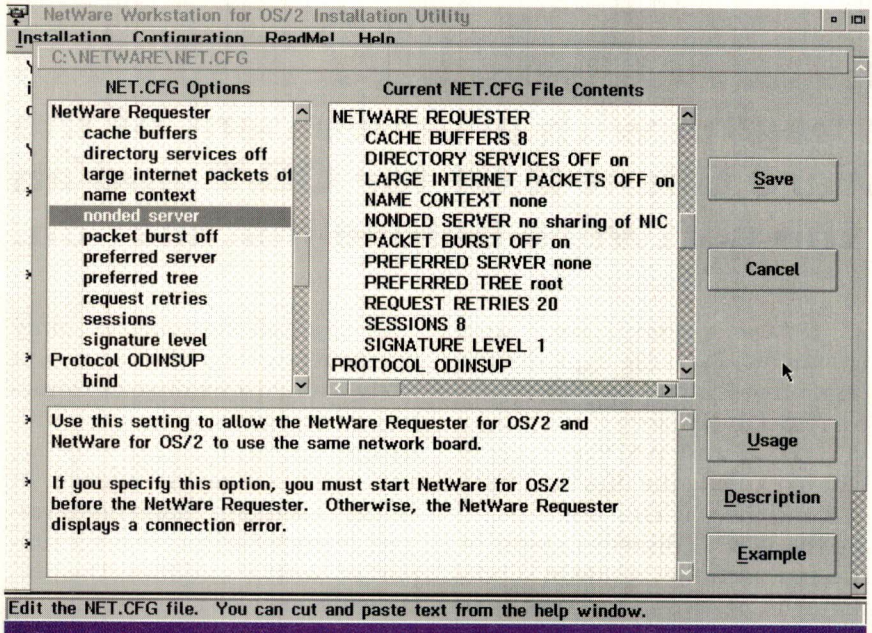


Figure 5: Configuration and This Workstation lead to editing the *net.cfg* file and referencing *net.cfg* parms. This facility is new for version 2.0x. Usage, Description and Example buttons alter the lower panel information text for each option line.

interface cards (NICs) or higher level industry-standard interfaces provided by software such as IBM Extended Services.

Before running the installation program, we reviewed the readme file with an ASCII file editor. This practice is important when you are working with NetWare software. Last-minute information vital to making the software work properly is sometimes found in the documentation files rather than the manual. In advance of installation and configuration, we learned a few important things that could impact our configuration-related decisions.

We read that remote workstations are not yet supported. The Remote Initial Program Load files were promised for an unspecified later date. The new Ethernet default for IPX under ODI drivers is the 802.2 frame type, which is consistent with NetWare 4.x and new NetWare 3.x server and client drivers. Compatibility of the new frame type with existing networks must be assessed. Some routers do not support the Ethernet 802.2 frame type for IPX. Workarounds deploying frame types other than the new default are outlined. Login from a global DOS session is not supported; Novell recommends logging in from an OS/2 session if the configuration specifies global DOS and Windows IPX support.

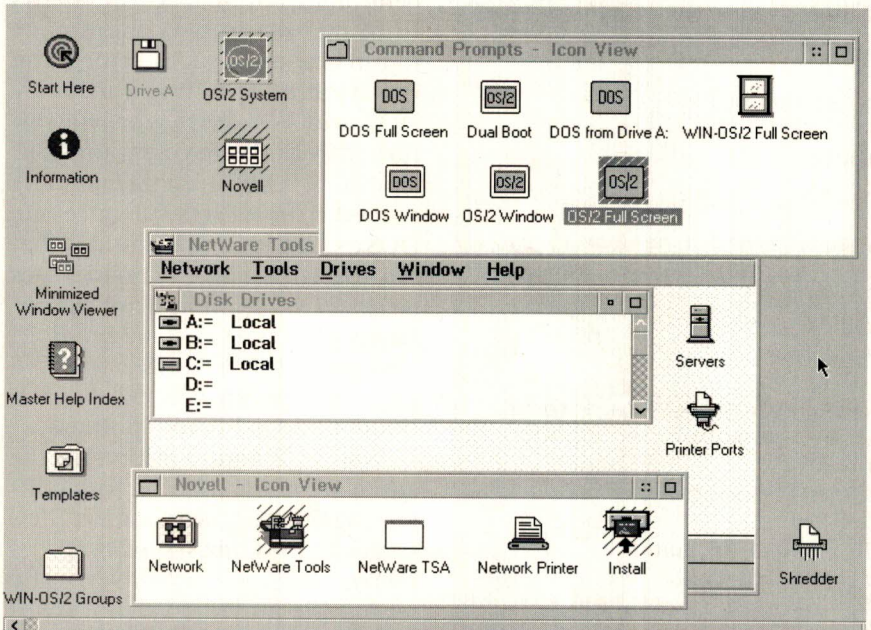


Figure 6: The Novell Icon View sits proudly on the OS/2 desktop. The familiar NetWare Tools is especially useful. A network folder lets us select detailed file-server resources across the enterprise network. NetWare support capabilities vary across different kinds of sessions.

Launching INSTALL

After arming ourselves with knowledge from the readme file and taking the manual in hand, we were ready to begin the installation. The INSTALL program on the WSOS2_1 floppy can be run from an OS/2 Window or full screen. After installing all versions of the NetWare Requester for OS/2 since inception, it was a pleasure to see how far the Workplace Shell-based install.exe has developed in terms of user friendliness and features. The NetWare Client for OS/2 Installation Utility screen appears with an inviting greeting and straightforward instruction bullets. All key installation options are on the Installation menu.

Below Installation, we chose Requester on workstation. From there, we had to confirm the source

After arming ourselves with knowledge from the *readme* file and taking the manual in hand, we were ready to begin the installation.

drive, a:, and destination directory on the OS/2 workstation's hard disk, *c:\netware*. Next, we were faced with choices of whether or not to edit the *config.sys* file and which files we wanted to copy. Options are provided to: edit *config.sys* and copy all files, only edit the *config.sys* file, only copy the requester files, and only copy ODI LAN driver files. We relied on the help screens to understand when each option should be used. Since the NetWare Client 2.01 for OS/2 was not yet installed on the workstation, our choice was to edit *config.sys* and copy all files. The other three options are designed for partial installations or *config.sys* editing that might be required down the road.

The "edit *config.sys* and copy all files" option has three steps. Step 1 requires selection of a default LAN driver. The WSDRV_1 floppy must be placed in the source drive so the installer can review the drivers and click on a selection. We chose token.sys for IBM Token-Ring. Step 2 allows NetWare support for DOS and Windows applications to be turned on (the default is "off"). We picked the "on" button so we could fully experience OS/2 as a "better Windows than Windows." In addition, we clicked "Global NetWare shell support" instead of "Private NetWare shell support" since we wanted the same logins and drive mappings across all OS/2 and DOS sessions. With Private sessions, logins and drive mappings would be unique for each session. Step 3 involves optional protocols for OS/2 sessions. We selected SPX support, NetBIOS emulation, and remote named pipes support (client only). After completing the optional protocol selections, the installation program updated the *config.sys* file.

The greatest number of supported options are provided for OS/2 sessions and private sessions using a real DOS kernel and running the NetWare 4.0 DOS workstation VLMs, as shown in Table 1. They are the only session types that have NetWare Directory Services (NDS) support. However, all types of sessions have NetWare 3.11 bindery support. Partial print management for DOS sessions means that, while NetWare 4.0 print utilities can be used to manage print jobs, only queues that are in the bindery context of NetWare 3.11 server objects can be viewed.

Before the files actually copy to the workstation hard disk, *INSTALL* asks whether the default driver or all drivers should be copied. We requested all drivers to have them readily available for perusal and experimentation with different NICs and various configurations. The ODI LAN drivers and requester files were then copied to *c:\netware* from WSDRV_1. WSOS2_1 and WSOS2_2 had to be inserted into the source drive to complete copying the full file set to *c:\netware*. (Also, files for NetWare WIN-OS/2 support, such as *nwipxspx.dll*, *net-*

Table 1: Netware session support for OS/2 2.1

Feature	OS/2	PRIVATE VIRTUAL DOS	GLOBAL VIRTUAL DOS	PRIVATE VIRTUAL WINDOWS	GLOBAL VIRTUAL WINDOWS	PRIVATE WITH REAL DOS KERNEL & NETWARE 4.0 VLMs	PRIVATE WITH REAL DOS KERNEL & NETWARE 3.11 NETX
NETWARE 4.0 NDS	X					X	
NETWARE 3.11 BINDERY	X	X	X	X	X	X	X
NETWARE 4.0 NETWORK ADMIN UTILITIES	X					X	
PRINT JOB MANAGEMENT	X	P	P			X	
NETWARE 4.0 TOOLS	X					X	
NETWARE 4.0 ELECTRONIC DOCUMENTATION				X	X		

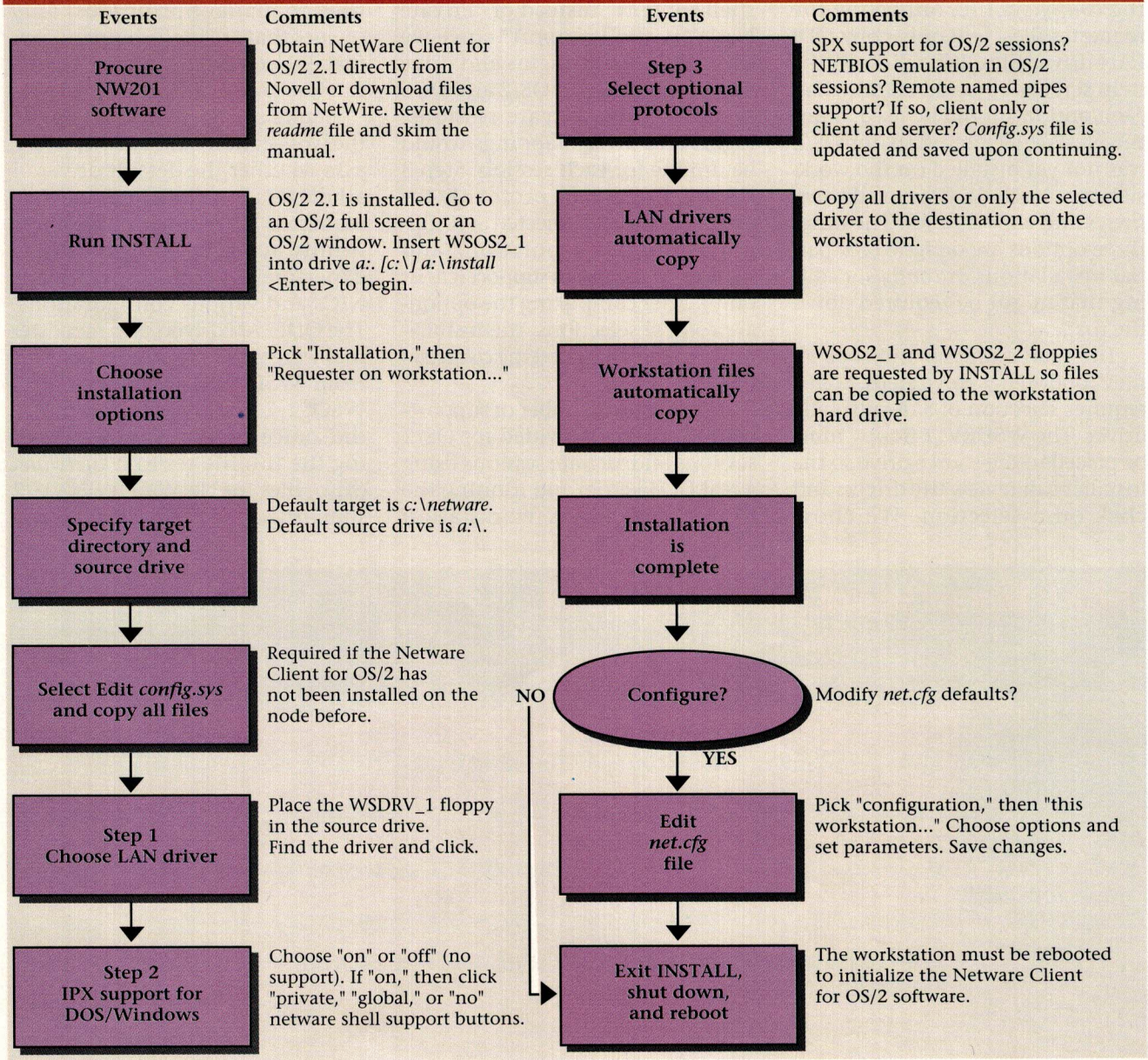
X = WORKSTATION HAS THE CAPABILITY TO ACCESS THE NETWARE FEATURE FROM THE SESSION TYPE.
P = PARTIAL ACCESS CAPABILITY.

ware.drv, *netapi.dll*, and *tbmi2.com*, were automatically copied to *c:\os2\mdos\winos2\system*.) At that point, installation of the software was finished and the NetWare Client for OS/2 could initialize upon rebooting. The *INSTALL* program informed us that we might need or want to configure the workstation (editing the *net.cfg* file via the Configuration menu option and "This workstation..." below it).

Configuration is exercised for any number of reasons. *INSTALL* suggests we might find it desirable to:

- Define a NetWare Requester Name Context statement to avoid typing in our context on the command line when we login.
- Include the Ethernet 802.3 frame type as well as 802.2, (the new default), for backward compatibility with older NetWare 3.x and 2.x drivers running in production Ethernet.
- Use a NetWare Requester Preferred Tree statement if more than one directory tree exists.
- Deploy a Link Driver statement if the NIC is not set to default settings.
- Define a Link Driver statement for each NIC if the workstation

Table 2: First-time installation flow diagram for Netware Client 2.01 for OS/2.


Events
Comments
Procure NW201 software
Obtain NetWare Client for OS/2 2.1 directly from Novell or download files from NetWire. Review the *readme* file and skim the manual.
Run INSTALL
OS/2 2.1 is installed. Go to an OS/2 full screen or an OS/2 window. Insert WSOS2_1 into drive *a:*. *[c:\] a:\install* <Enter> to begin.
Choose installation options
Pick "Installation," then "Requester on workstation..."
Specify target directory and source drive
Default target is *c:\netware*. Default source drive is *a:*.
Select Edit *config.sys* and copy all files
Required if the Netware Client for OS/2 has not been installed on the node before.
Step 1 Choose LAN driver
Place the WSDRV_1 floppy in the source drive. Find the driver and click.
Step 2 IPX support for DOS/Windows
Choose "on" or "off" (no support). If "on," then click "private," "global," or "no" netware shell support buttons.
Events
Comments
Step 3 Select optional protocols
SPX support for OS/2 sessions? NETBIOS emulation in OS/2 sessions? Remote named pipes support? If so, client only or client and server? *Config.sys* file is updated and saved upon continuing.
LAN drivers automatically copy
Copy all drivers or only the selected driver to the destination on the workstation.
Workstation files automatically copy
WSOS2_1 and WSOS2_2 floppies are requested by INSTALL so files can be copied to the workstation hard drive.
Installation is complete
NO
Configure?
Modify *net.cfg* defaults?
YES
Edit *net.cfg* file
Pick "configuration," then "this workstation..." Choose options and set parameters. Save changes.
Exit INSTALL, shut down, and reboot
The workstation must be rebooted to initialize the Netware Client for OS/2 software.

While we optimistically hope there will not be any (or many) NSDs this time around, the "NSD on workstation..." feature is a nice touch.

has multiple NICs.

- Utilize statements allowing the NetWare Client to share a NIC with other communication software, such as IBM Extended Services, IBM LAN Services, or Novell's NetWare for OS/2.
- Configure parameters for special resource settings pertinent to IPX, SPX, Named Pipes, Novell NetBIOS, Token-Ring source routing, maximum packet size, and so on. We will look at the *net.cfg* settings in the configuration section.

CONFIG.SYS

The INSTALL program modified path lines in the OS/2 2.1 *config.sys* file, changing them to:

```
LIBPATH=.;
  C:\OS2\DLL; C:\OS2\MDOS;
  C:\; C:\OS2\APPS\DLL;
  C:\MMOS2\DLL; C:\NETWARE;
SET PATH=C:\OS2;
  C:\OS2\SYSTEM;
  C:\OS2\MDOS\WINOS2;
  C:\OS2\INSTALL;
  C:\; C:\OS2\MDOS;
  C:\OS2\APPS; C:\MMOS2;
  C:\NETWARE; L:\OS2; P:\OS2;
SET DPATH=
  C:\OS2; C:\OS2\SYSTEM;
  C:\OS2\MDOS\WINOS2;
  C:\OS2\INSTALL; C:\;
  C:\OS2\BITMAP; C:\OS2\MDOS;
  C:\OS2\APPS; C:\MMOS2;
  C:\MMOS2\INSTALL;
  C:\NETWARE; L:\OS2; P:\OS2;
```

Directories *c:\netware*, *l:\os2*, and *p:\os2* were added. Since NetWare for OS/2 workstations do not have search drives, such as their NetWare Client for DOS siblings, all searching must be done through the *LIBPATH*, *PATH*, and *DPATH*. Remember *c:\netware* is the subdirectory to where the NetWare workstation drivers and "requester" files were copied.

The directory *l:\os2* corresponds to a file-server attachment mapping. Upon attaching to a file server after the OS/2 workstation initializes, *l:* is actually map rooted to the file server LOGIN subdirectory. LOGIN contains only DOS programs. The workstation must be able to search *login\os2* for the OS/2 *login.exe* and related LOGIN programs. Likewise, *p:* will be map rooted to the file server's public subdirectory after login. Using the same logic, the OS/2 PUBLIC programs reside in *public\os2*.

In addition to the modified path lines, the entries in Listing 1 were appended to the OS/2 *config.sys*. They initialize the NetWare Client for OS/2 software via drivers and daemons based on configuration choices that were made in the *INSTALL* program.

After the language is set to English, the NetWare section of the config.sys builds an ODI structure. *Lsl.sys* and *ddaemon.exe* load at the link-support layer. The Token-Ring LAN driver, *token.sys*, provides the link-layer interface to the IBM Token-Ring adapter, to cement the physical and link layers together . Its companion program, *route.sys*, facilitates IBM Token-Ring source routing. Next, the protocols, such as IPX, SPX, Named Pipes, and (later) NetBIOS, load with their respective daemons. SPX and NetBIOS sit on IPX while Named Pipes rides SPX.

If the *npserver.sys* line was unremarked and a name placed after the *npdaemon.exe* line, the node would initialize as a SAPing Named Pipes server daemon. The server daemon can support Microsoft SQL Server or another back-end application platform designed to utilize the Named Pipes protocol. *Nwreq.sys* is the actual workstation or "requester." *Nwifs.ifs* initializes the NetWare Installable File System. *Vipx.sys* and *vshell.sys* are enabled for global virtual DOS and Windows sessions. Private virtual DOS and Windows sessions require only *vipx.sys*; afterward, NETX must be loaded manually or via *autoexec.bat*. Physical, link, network, transport, and session layers have been initialized by the end of the *config.sys*.

INSTALL ad nauseum

Other noteworthy options can also be found under Installation on the main menu. Below "Requester on workstation..." is "NSD on workstation..." for applying NSDs. While we optimistically hope there will not be any (or many) NSDs this time around, the feature is a nice touch. Options for installing and configuring remote workstations (that is, workstations without hard disks), and for putting the NetWare for OS/2 driver and file server files onto the workstation, are respectively the third and fourth options listed under Installation. The NetWare for OS/2 (file server) files are copied from supplemental floppies that must be separately obtained from Novell.

The Configuration option brings up two selections whereby the *net.cfg* for "This workstation..." or "Remote workstations..." can be edited. The editor brings up three

The combination of IBM OS/2 2.1 and Novell NetWare Client 2.01 is a powerful offering that demands a good manual

display panels. The upper rightmost panel displays the current *net.cfg* file. All possible *net.cfg* options are listed next to it in the upper left panel. When the cursor bar highlights each option, information about the option is displayed in the lower panel. Information in the lower panel can be switched between Description, parameter Usage, and Example. Editing and referencing can be done at the same time in a very efficient manner. A third main item displays the *readme.1st* file that we looked at before launching INSTALL. The fourth main menu option provides help screens.

Documentation of the NetWare Client for OS/2 is extensive at 300 plus pages. The combination of IBM OS/2 2.1 and Novell NetWare Client 2.01 is a powerful offering that demands a good manual.

The manual is included in the $30 package from Novell or can be downloaded from NetWire in the form of 17 compressed PostScript files. The documentation is detailed, well-written, easy to understand, and chock full of juicy configuration details. The days are long gone when the local Novell branch office had to fax supplemental undocumented material for our configuration gymnastics to be completed. Graphic illustrations reveal the underlying interoperability combinations to facilitate full IBM-Novell integration. IBM must be pleased with the thoroughness of this Novell manual.

Inside net.cfg

The sample *net.cfg* file, shown in Listing 2, illustrates all options in capital letters. Default value is shown at the end of every line in numeric or lower-case characters. Each section contains a brief definition as *";"* remark in lower-case characters.

In the absence of a *net.cfg* file, the defaults that initialize new NetWare Requester options are especially interesting. NetWare 4.x directory services are supported by default. Large internet packets enable maximum packet size to be supported in workstation-to-file server communication through routers. Packet burst between workstation and file server is likewise facilitated. NONDED SERVER enables the NetWare Client for OS/2 software to share a single NIC with NetWare for OS/2 file-server software. NetWare for OS/2 and Virtual Multiple Link Interface Driver (MLID) sections are new with NetWare Client 2.01.

Harmony

Upon rebooting, installation and configuration confusion turns into operational harmony. A Novell icon and a network folder appear on the desktop after the software comes up. Within Novell, various icons represent Install, NetWork Printer (NPrinter), NetWare Storage Management System (SMS), Target Service Agent (TSA) for OS/2, and NetWare Tools. NPrinter can be used to connect or disconnect to a remote printer on the network. NetWare SMS TSA facilitates SBACKUP of the workstation's hard drive.

NetWare Tools is a multifunction utility for attachment, login, mapping drives, messaging, print capturing, and so on. The network folder displays an icon for every NetWare server on the network. Clicking on a server icon brings up icons and folders pertinent to print queues and file-server volumes.

However, curiosity beckons us back to the configuration process. Should we stick with a "straight" *token.sys* or Ethernet driver, or bring *odinsup.sys* or *lansup.sys* into the picture along with the Communications Manager of IBM Extended Services? Why not also throw in IBM LAN Services? We could deploy Novell NetBIOS and IBM NetBIOS concurrently. Where is TCP/IP? ISO? How about creating some individual DOS and Windows sessions with real DOS kernels or private virtual DOS? And let's not forget the NetWare for OS/2 non-dedicated file server that we yearn to get our hands on. For now, we will resist the enticement. Enough is enough lest we fly too close to the sun.

We were very pleased to experience the unity of OS/2 2.1 and NetWare Client 2.01 for OS/2. A fast 486-based computer with 16Mb RAM and a few hundred megabytes of disk storage is desirable for running them. The joint implementation represents a definite high point in the IBM-Novell alliance. Based on our experience, market impact of the two products working together is bound to be significant. IBM's OS/2 platform has finally matured and established deep roots after six years since its initial release.

Bob Panza is a LAN consultant affiliated with EJR Computer Associates in Hoboken, N.J. and The Systems Expert in Woodbury, Conn. He can be reached on CompuServe as 71611,1262.

WIPE OUT... IS WHAT WE'D DO TO THE COMPETITION, (IF THERE WAS ANY).

ASK ABOUT WIPEOUT'S NEW AFTER DARK SUPPORT.

WipeOut offers over 50 different screen saver variations. Your only other choice offers less than 10. That's not competition, that's imitation. Don't settle for less, get the authentic screen saver for OS2...WipeOut from BocaSoft, developer of BocaSoft System Sounds™, the only "ears" for OS2.

BOCASoft
117 NW 43rd Street
Boca Raton, FL 33431
For information: 407-392-7743

WipeOut
To order: 800-776-8284
or visit a retailer near you.

Reader Service No. 23

Customizing your OS/2 Desktop

In OS/2, as with all graphical user interfaces, you'll find that screen real estate is at a premium. If you fill the screen with open program and system folders, you crowd out application windows. By default, the OS/2 desktop installs itself at 640 x 480 (standard VGA) screen resolution, which is really less than enough space for application windows and open program folders to coexist. One stopgap remedy is to reduce the font size in less-important windows, making them proportionately smaller using by the control menu at the top left side of the screen and selecting "Font size..." A better idea is to reduce the number of open "utility" folders on the screen, creating copies of the programs you absolutely need as free-floating icons.

After you've done some initial fishing around in OS/2, you'll want to avoid constant searches through nested folders to get at the files and features you need. OS/2's flexible desktop allows you to replace the hodge-podge of application folders with

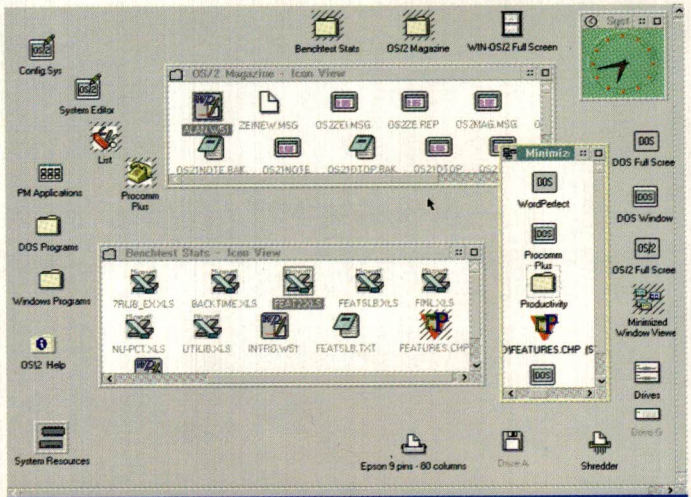


Figure 1: An optimized OS/2 desktop. You can start programs by clicking on free-floating desktop icons or documents in data folders. A number of applications are running in the background (shown in Minimized Window Viewer).

Here's how to get the most out of your screen's real-estate.

BY LENNY BAILES

well- organized data folders. You can group files by project, date, or application type. Related spreadsheets, graphs, and reports can all share a common folder. Click on the data files you want to see and automatically start their corresponding applications. This method is faster and more efficient than repeatedly sifting through separate folders.

OS/2 has two subtly different ways to duplicate an icon. You can copy an icon or create a shadow. One rule of thumb in organizing the desktop is to create copies of utility and OS/2 System programs and create shadows of your data files and documents

When you copy a program icon, you create an independent object that can be moved, launched, or renamed without affecting the original. A "desktop shadow" is a token that retains its link to the original file. If you rename or edit a "shadow," the changes you make are passed on to the original. Working with shadows of data files can be more convenient than dragging the originals out of their folders. You can rearrange the shadows in new folders or delete them from the desktop with impunity.

Let's make copies of the OS/2 System Editor and some command prompts. Click open the green OS/2 System Folder, open the Productivity folder, and select System Editor. Rather than dragging the icon to the desktop, click on it with the right mouse button to open its pop-up

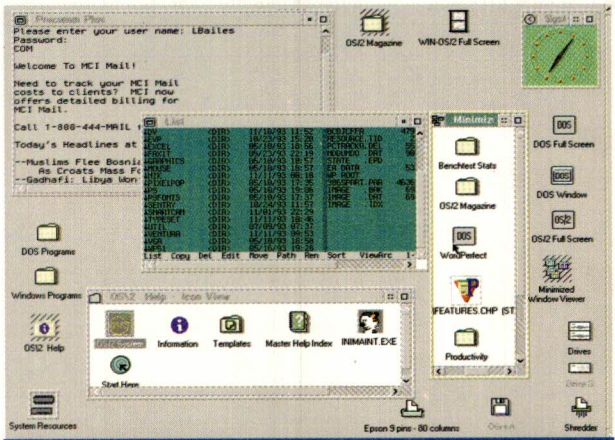


Figure 2: By clicking in Minimized Window Viewer, you can switch the desktop between data folders and running applications. Note: the OS/2 System and help icons have been tucked away in a single "OS/2 Help" folder.

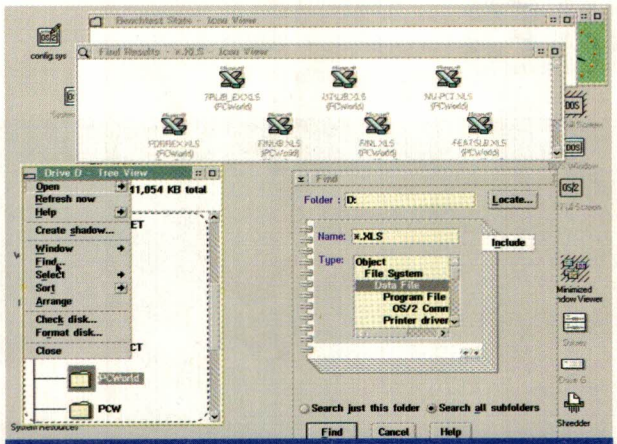


Figure 3: The "Find" option of OS/2's "Drives" can be used to search for data files with a designated file-extension. A series of Excel spreadsheets have been retrieved into the "Find Results" folder.

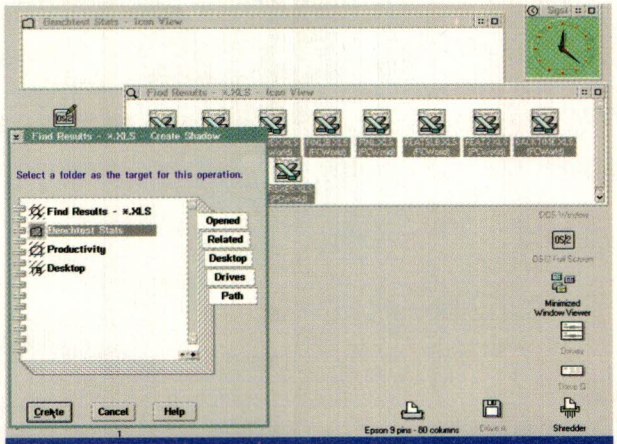
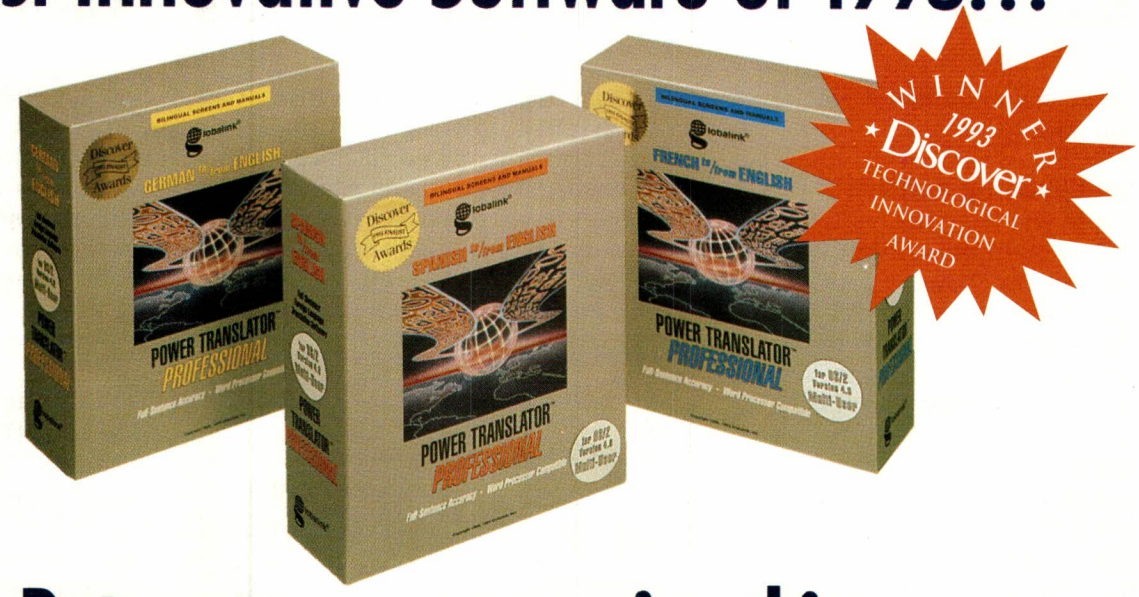


Figure 4: The contents of the "Find Results" folder are copied in a group to data folders of your choosing.

menu. Click on Copy and choose Desktop as the destination. Now, close the Productivity Folder and open the Command Prompts folder. Depending on your work habits, you may want to create copies of OS/2 or DOS command prompts in either full-screen or windowed sessions. Each time you click on Copy and Desktop a new icon pops up at the destination. You may also want to copy the Drives icon, which is OS/2's low-level file manager. You will be using the Drives tree view later to create document folders.

One thing that many OS/2 users want to do when starting out is to quickly edit or view the settings in the *config.sys* file. Since you've already got the System Editor out on the desktop, here's a quick-and-dirty way to create a *config.sys* icon: Make a copy of the System Editor already on the desktop from its pop-up menu or select it and hold down the <Ctrl> key and right mouse button to drag out a copy. A dialog box will appear, prompting you for a new name. Type in *config.sys*. Open the new object's settings (click on the icon with the right mouse button, click on the Open arrow, and select Settings). The Path and Filename box duplicates instructions to run *e.exe*, the OS/2 System Editor. In the Optional Parameters box type in *\config.sys*. Close the settings by clicking in the upper left-hand corner. You can now stash your new *config.sys* icon in some convenient corner of

A Blue-Ribbon Panel Named POWER TRANSLATOR™ *PROFESSIONAL* Most Innovative Software of 1993...



But our users are saying things that *really* make us proud.

"...it saves an enormous amount of time..."
— Eric Vogt, *American Red Cross translator*

"...I really expanded my vocabulary, my grammar ...using the program has been just great."
— Jamala Banks, *Howard University student*

The prize: 1993 Discover Award for most innovative software. The judges: John Dvorak, Michael Miller, Marvin Minsky, Esther Dyson, and Stewart Cheifet. Their Affiliations: *PC Magazine*, *PC Computing*, *MacUser*, *Computer World*, *Computer Chronicles* and MIT. The winner: **POWER TRANSLATOR *PROFESSIONAL*** foreign language translation software, from Globalink®!

Ready!™ for OS/2

But our users don't think about "innovation." They have specific work in mind.

For Eric Vogt, translator for the American Red Cross, **POWER TRANSLATOR *PROFESSIONAL*** guarantees consistency and "...saves an enormous amount of time... A person simply can't remember 5,000 scientific terms and how they translated each of them the last time." For Jamala Banks, a language student at Howard University, "what you would normally take a day on, you can now virtually do in just minutes!"

Available for DOS, OS/2,® Macintosh® and UNIX,® **POWER TRANSLATOR *PROFESSIONAL*** features speeds up to 100 times faster than human translators, easily-updated dictionaries of over 250,000 words and phrases and a 90%-plus accuracy rate! Subject dictionaries are also available, including computer, legal, business and finance.

Find out about the software package that's got Discover Magazine – and a lot of other people – talking. Call Globalink today and ask about POWER TRANSLATOR *PROFESSIONAL*, your ticket to world-wide communication.

Globalink, Inc.
9302 Lee Highway, Fairfax, VA 22031
Intl.: 1-703-273-5600
Fax: 1-703-273-3866
1-800-767-0035

Incredibly accurate translations: English to/from Spanish, French, or German

Reader Service No. 24

If you like, you can create more workspace

by gathering up the OS/2 Help and Information icons. Unclutter the desktop by placing these and the OS/2 System Folder in a single OS/2 Help Folder.

the screen and open it whenever you want to.

Manipulating Folders

While you have the OS/2 System Folder open, you might want to activate the System Clock. If you drag a copy to the Startup Folder, OS/2 will launch it every time you boot up. The same goes for the Daily Planner and To Do lists over in the Productivity folder. Now you can close up the OS/2 System Folder. You've placed some basic operating system tools for easy access on the desktop. The same procedure can be repeated with programs in your DOS and Windows application folders. You'll probably want easy access to a telecommunications program. (If you don't have one from a third-party OS/2 vendor, you might prefer your DOS or Windows package to IBM's PM Terminal, which has a cumbersome interface and limited features.) If you already had a copy of Windows on your system before OS/2, you might try Microsoft's Terminal. You may also want to set up some kind of a file manager to supplement OS/2's Drives tool. The Windows File Manager or DOSShell may prove handy. I use Vern Buerg's "List," a venerable shareware utility available in both DOS and OS/2 flavors.

Remember, the object is not to get bogged down with too many icons! If you regularly do word processing, spreadsheet calculation, or database maintenance, you don't have to make copies of your WordPerfect, Excel, or dBase programs. Instead, you will create document folders containing objects that automatically launch these programs. (I'll show you how in a moment). Notice that, in Figure 1, the documents in the OS/2 Magazine and Benchmark Stat folders can launch a variety of different applications. The program icons along the top and sides of the screen are your system utilities.

Don't underestimate the power of the Minimized Window Viewer and the OS/2 Windows List. In Figure 2, we have multiple applications and document windows open, but they are hidden from the desktop by clicking their Minimize buttons (at the top right of the title bar). You can quickly exchange open windows by clicking in the Minimize Window Viewer.

If you like, you can create more workspace by gathering up the OS/2 Help and Information icons. Unclutter the desktop by placing these and the OS/2 System Folder in a single OS/2 Help Folder.

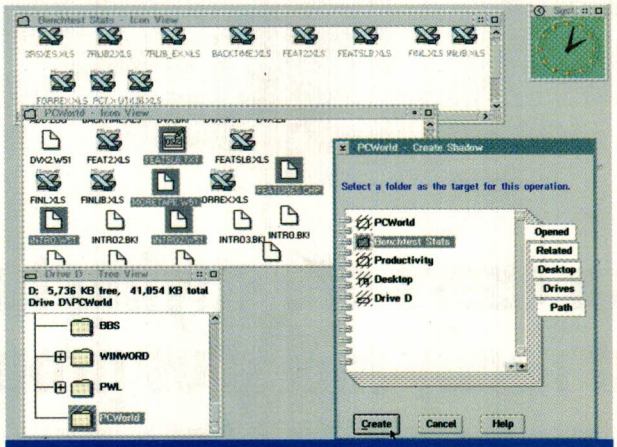


Figure 5: You can use the OS/2 "Drives" tree to select individual datafiles, then "shadow" them from the original folder/directory to a data folder of your choosing.

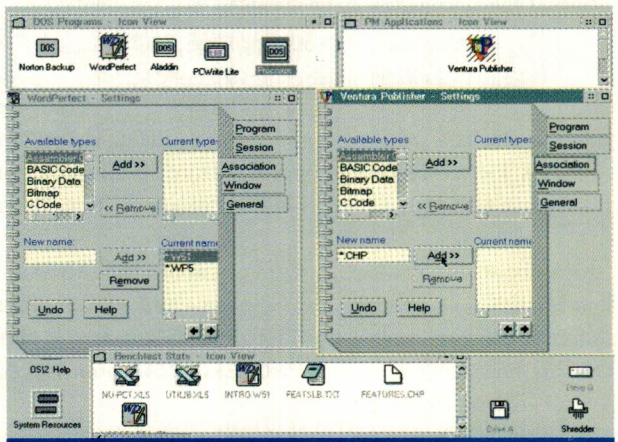


Figure 6: The "Associations" page of an application's settings associates documents by their three-letter file-extensions. After *.chp is added to Ventura's current names list, clicking on a document with the .chp extension will automatically load it into Ventura Publisher.

Setting Up Shadow Document Folders

If you've studied the OS/2 manual, you've probably seen IBM's suggested method for building file associations. Here's another "quick and dirty" shortcut. This one avoids the problems and complexities of OS/2's data-file templates. Use the Drives tool

There's still one hazard on the road to client/server.

ATF can help you get around it.

Operating systems are stable. GUI's are well understood. Development tools are available. Costs are down. There's still one hazard on the road to client/server: How to manage quality risk.

The Softbridge Automated Test Facility is the only testing solution built to handle all parts of client/server testing. GUI front ends. Networked data servers. Real world, real time work-flows. Legacy apps.

To learn more about ATF, call 800-955-9190.

ATF: The Softbridge Automated Test Facility

Softbridge, Inc. 617-576-2257 (Phone); 617-864-7747 (FAX)

Reader Service No. 25

WATER

Water is not the pure and natural resource it once was. The effects of global warming, acid rain, and chemical technology have tampered with it. To protect our water from pollution, we ask that you think about how you dispose of chemicals, garbage, and other contaminants.

Another set of helpful hints from the Green-Keeper Series, sponsored by the MFI Green Project of Miller Freeman, Inc. San Francisco, CA.

Here are some helpful hints.

1. ***Keep Your Trash Out of the Gutter:*** Sweep your driveways and sidewalks instead of hosing them with water. Put trash in the can instead of the gutter.
2. ***Get Rid of Garden Pests:*** Put ladybugs or praying mantis in your garden instead of using insecticides. Contact your local nursery for alternative ideas to herbicides and pesticides.
3. ***Fix Your Car Leaks:*** Recycle your motor oil at your local mechanic or garage. Don't dump it into a storm drain. More oil enters beaches and lakes from urban runoff than from tanker spills.
4. ***Use Non-Toxics:*** Buy earth-friendly products now. Vinegar and baking soda are excellent cleaning agents.

Adhering to these tips will benefit the water you drink, the water you swim and bathe in, and the food you eat.

CPUMonitorPlus

CPU Monitor Plus **is the unmatched standard for Performance, Analysis and Measurement on your OS/2 PC.**

Easily configure CPU Monitor Plus' intuitive, real-time displays. Let the powerful analysis engine rip through raw system data and give you graphs or text, percentages, ratios, bytes or seconds.

And much, much more!

- Display real-time CPU utilization data for any process and thread.
- Display real-time RAM utilization data including in-use, allocated, private and shared totals for all programs.
- Detect and stop hidden, invisible and runaway programs.
- Log data to output file for later analysis.
- Suspend and resume individual threads in your Presentation Manager applications.
- Works with OS/2 versions 1.2, 1.3, 2.0 and later.

BonAmi Software Corporation
60 Thoreau St. • Suite 219
Concord, MA 01742 USA
508.371.1997

Reader Service No. 27

icon to search for and shadow a group of icons to the folders of your choice. Then, set up associations in the application programs rather than in the data files. Associate the documents by their three-letter file extensions.

I commonly create statistical spreadsheet files with Excel and text files with a variety of different word processors. I organize my desktop by creating two new folders. I drag the folder icon from the Templates folder to the desktop twice and name my work folders Benchtest Stats and OS/2 Magazine. (Hold down <Alt> and click on the folder to change its name.) I now open the OS/2 Drives icon and search for *.xls* Excel documents on drive D, my data drive. (Click on the title bar-icon in the upper left corner and select Find.) A folder called Find Results appears, loaded with spreadsheets, as shown in Figure 3. Select these files as a group by holding down the left mouse button continuously. You can create shadows en-masse by popping up the menu for one of the selected data files. (Or hold down <Ctrl-Shift> and drag the group to the Benchmark Stats folder while holding down the right mouse button.)

In Figure 5, I pick and choose individual word-processing files to shadow from the already-established PCWorld directory to Benchmark Stats. (Click on each file individually with the <Ctrl> key and right mouse button held down.)

Once I've got my data files in folders, I build file associations in the applications that will edit them. (The OS/2 procedure for creating and building menus in data file templates is clumsy and less reliable.) When I searched for my *.xls* spreadsheets, OS/2 was already aware of the link between this file extension and Microsoft's Excel. Note that the spreadsheets I retrieved into the Benchtest Stats folder already displayed the Excel icon. Documents that have no file-extension association bear generic text icons. Simply find the program that corresponds to these in the DOS, Windows, or PM application folder. Open the application's settings book (click on the icon with the right mouse button held down, click on the Open arrow, select Settings, then click on Association). On the bottom half of the Association settings you find columns for New and Current filenames. For WordPerfect, I add **.wp5* and **.w51* to the list, since these are the extensions I use under DOS for my WordPerfect documents. Ventura Publisher's documents all bear the *.chp* file extension.

Once a file extension has been added to a program's association list, all data files that bear the extension will eventually assume the application's icon. You may have to reboot the system to make the change take effect globally. To force a single data object to assume its proper icon, you can click on it with the <Alt> key and right mouse button held down.

If you find an icon you like on the desktop, just select and drag it to the current icon box in General Settings

Here's a quick way to assign more interesting icons to your generic DOS applications. Open the application's settings book and go to the General Settings page. If you find an icon you like somewhere else on the desktop, just select and drag it to the Current Icon box in General Settings. The Windows Program and OS/2 Productivity Folders are good places to look for a variety of icons.

The Current Name field can also be used globally for file associations. For example, if you type in XYZ, then all objects whose names begin with XYZ will be launched by your application, regardless of their three-letter file extensions. If you list the same extension in two different programs, precedence is given to the first program you choose. The second program association is saved as a subsidiary choice on the data file's pop-up menu.

Lenny Bailes is a writer, teacher, and consultant in the San Francisco Bay area. He can be reached via CompuServe as 70713,562.

Changing *config.sys*

Here are a few changes to the default *config.sys* file that many OS/2 users find useful:

- Enable Undelete by removing the REM from the *"SET DELDIR=C:\DELETE 512;...."* statement.
- Back up your OS/2 *.ini* files on an automatic basis by adding the two following lines to the end of the file:

```
CALL=C:\OS2\XCOPY.EXE
   C:\OS2\*.IN1
   C:\OS2\*.IN2

CALL=C:\OS2\XCOPY.EXE
   C:\OS2\*.INI
   C:\OS2\*.IN1
```

- If you are using the High Performance File System (HPFS), place REM in front of the statement that reads:

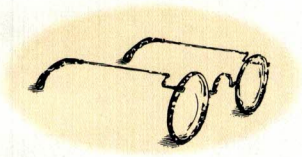
```
DISKCACHE=256,LW
```

If you are using only the FAT file system, modify the DISKCACHE statement to read:

```
DISKCACHE=512, LW, AC:[d:]
```

where [d:] is your OS/2 boot drive.

{ *figure 1.* }



SPECTACLES

{ *figure 2.* }

OBSERVATORY

Is Your Vision In Focus?

Information is your business' most powerful leverage against your competition. Visualize the competitive advantage you would realize if your business managers could easily *access, manipulate and review data* that already exists but isn't available in a timely, flexible fashion.

It's no longer a dream to think about giving your business the kind of *rapid access to information* that promises easily measurable ROI. Your competitors are scrambling to exploit these new technologies. The longer you wait to *retool your information delivery systems,* the less you have to gain. This March, discover how to take your company to the next competitive level at the first platform and product independent event of it's kind: **Business Software Solutions.**

Business Software Solutions is designed to show you how to get information into the hands of the people that can use it. Classes are hard hitting, clear discussions of *real world solutions* organized around 5 tracks:

PRODUCT & PLATFORM INDEPENDENT
HELP not HYPE

Constructing the Framework for Client/Server Success
Building Distributed Business Applications
Reengineering Business Information Delivery
Leveraging New Technologies for Competitive Advantage
Closing the Gap between IS and Users

Business Software Solutions runs in conjunction with Software Development '94, creating the industry's most comprehensive event for **building and integrating software for the enterprise.** You'll find over 200 conference sessions to choose from, together with all the tools you'll need from more than 250 strategic vendors, including Microsoft, Computer Associates, IBM, KnowledgeWare, Borland, Gupta, Novell and so many more.

If you're focused on distributed computing, take steps now to make your vision a reality.

Translating Business Needs Into Technical Solutions
Business Software Solutions

CONFERENCE & EXHIBITION

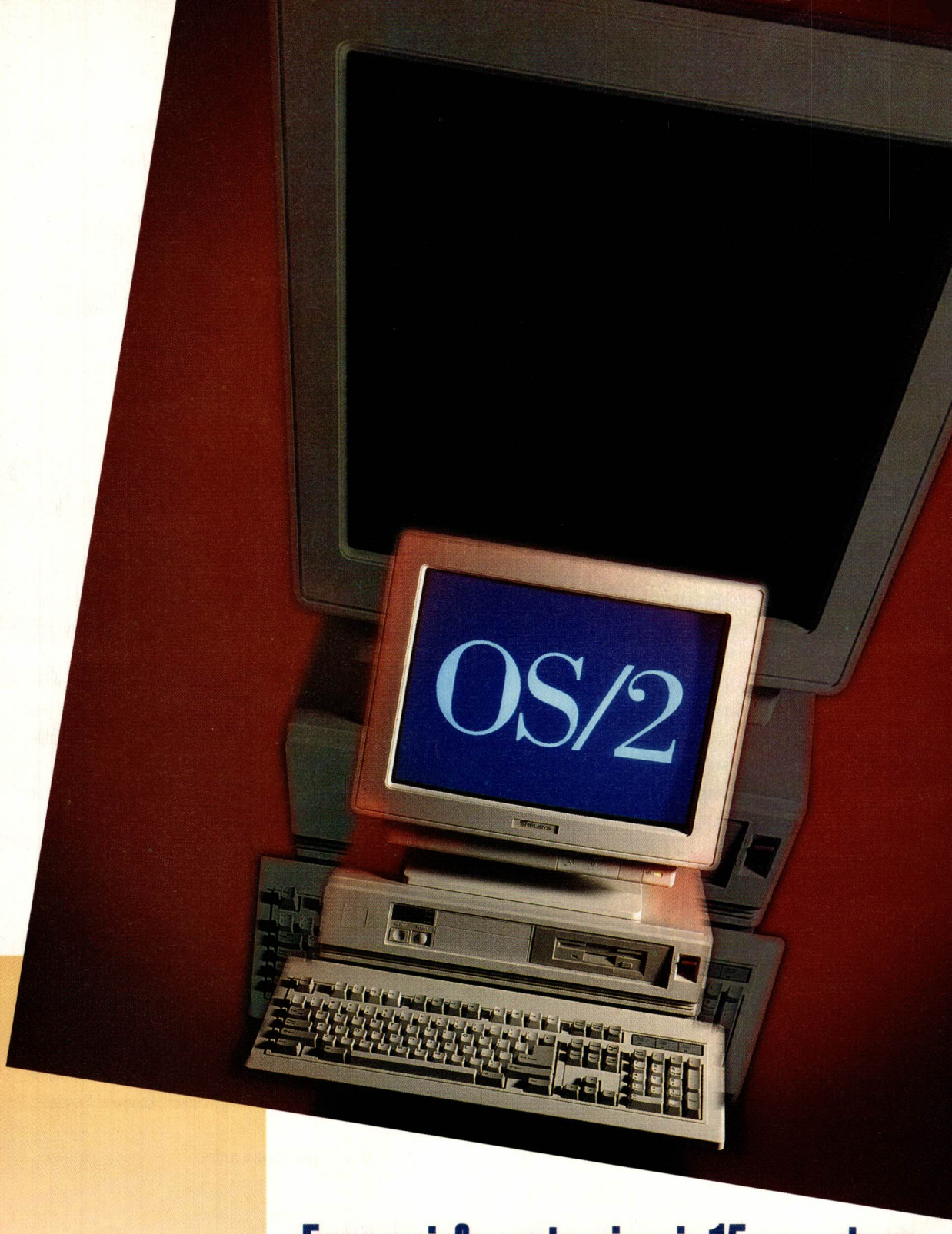
March 14-18, 1993
San Jose Convention Center

Call us at
415-905-2784
to find out more.

OS2M11

SOFTWARE DEVELOPMENT

Reader Service No. 28



From mainframe to micro in 15 easy steps

BY ROBERT B. CHAPMAN

DOWNSIZING To OS/2

Downsizing corporate applications is an exciting topic. With the introduction of OS/2 five years ago, it became possible to move some mainframe applications to the PC. With the release of OS/2 2.0, the capacity of the PC finally reached the critical value necessary for large-scale computing applications. OS/2 can execute enough processes simultaneously, support enough memory, and access enough disk space, to finally earn the PC the right to run corporate America's small business applications. Increases in hardware capacity have kept up with OS/2. Phenomenally quick microprocessors are on the market today. The quoted disk capacities and data transfer rates are staggering. The number of PCs that can communicate with a PC server machine are huge.

However, everything is not peaches and cream. During these early days of downsizing, an appropriate attitude to take is "Downsizer Beware." It is still possible to create a "small" application that can drive OS/2 to its knees. The intent of this article is to provide you, the average user and developer, with the basic understanding you need to succeed in your downsizing efforts.

Mainframe Hardware vs. PC Hardware

Most of the problems with downsizing are related to hardware capacity. Quite often, the processing load of the application exceeds the projected hardware requirements. This situation is caused by people looking at a machine's most popular ratings, the microprocessor MIPS (millions of instructions per second) and the maximum disk-transfer rate, as the sole representatives of power. These numbers are misleading and represent a fundamental problem with today's perception of PC performance.

Mainframes (in this article I am using the IBM ES9000 series to represent mainframes), have boring measurement numbers. Mainframe processors look slow compared to the new Intel Pentium processors. For example, the base CPU of an IBM ES9000 might be rated at 13 to 50 MIPS, while a Pentium is rated at from 60 to 100 MIPS. The difference in price is incredible. The mainframe might cost you $3 million while the Pentium will run $6,000. Let's take a look at the difference between an IBM mainframe running 50 MIPS and a Intel Pentium running at 60 plus MIPS. This comparison will identify the most significant reasons why the 50 MIPS mainframe can run thousands of those "small" applications while the 60 plus MIPS Pentium might choke on only one.

Channels vs. BUS structure

Mainframes have channels, which are direct paths to main memory. Each channel can transfer 10MB per second between the I/O devices attached to it and the main memory. A mainframe can have up to 256 channels. Aggregate I/O throughput of the mainframe can reach 2,560MB per second.

PCs have a bus, which is a shared data path , along which data travels between devices (microprocessor to I/O devices, I/O devices to memory, I/O device to I/O device). PCs can have one ISA, EISA, or MCA bus. Many new PCs also have one Local Bus available. The ISA bus can transfer up to 8MB per second. The standard MCA bus can transfer 20MB per second, but can be pushed, under special circumstances, to 160MB per second (no devices are currently capable of reaching this rate. Only a few adapter cards can operate at 40MB per second). The standard EISA bus can transfer 32MB per second but, theoretically, can be pushed higher (under the same special circumstances as the MCA bus). The local bus can transfer up to 132MB per second. Aggregate throughput of the PC bus runs from 8MB per second to a theoretical maximum that exceeds 300MB per second. Today's PCs rarely reach 8MB per second.

Channels vs. adapter cards

Each mainframe channel can connect to 16 units and each unit can connect to 16 devices. Devices include disk drives, printers, readers, and telecommunications devices. Up to 256 channels and over 65,000 devices can be physically connected to a single mainframe. Channels can communicate independently of the CPU and can control multiple units simultaneously. Channels require communication with the CPU only to start an I/O sequence and to manage the I/O interrupts. Channels are basically special-purpose computers that execute asynchronously with the CPU.

PCs can support a limited number of adapter cards, the maximum number depends on the available slots on the mother board. Seven adapters is a typical maximum. Different types of adapter cards are available. The early disk-controller adapter cards could connect to four disk drives, two of them floppy disks, two of them hard disks. SCSI adapter cards, the most flexible available, can support up to seven devices. Some asynchronous serial adapters can support over 16 serial devices simultaneously. Using these numbers as a guide, the maximum number of devices that can be attached to a PC can range from 28 to several hundred. In real life, however, the numbers are much lower. A typical high-end PC is typically connected to less than 10 devices, and usually cannot service all of those in a timely fashion.

Disk speeds and capacities

Mainframe disk drives are generally rated at around 18 milliseconds average access time. A typical mainframe disk drive has multiple head assemblies (up to six). Each head assembly has two actuators (basically an independent read/write head) that can be accessed (addressed and read/write data) separately from the others. Each head assembly can transfer data at rates exceeding 4MB per second. Several head assemblies accessed simultaneously can easily fill the 10MB per second capacity of a single channel. Mainframe disk drives broke the 1 gigabyte (GB) barrier over 15 years ago. The 100GB barrier was broken in 1993. Today, a typical mainframe disk drive can store 30GB of data.

PC disk drives are generally rated at around 12 milliseconds, which is the average access time. A PC disk drive has one head assembly. PC disk drives almost never fill the bus, but can reach bus capacity for short bursts of time. PC disks are available in capacities ranging from 100MB to 5GB. One mainframe disk drive can provide more disk space and transfer data faster than most of today's PCs.

Processor speeds

Mainframe processors are typically rated from 25 to 50 MIPS. Mainframes come with from one to six processors in a single complex. Mainframe processors typically perform from eight to 16 million float-

MVS has a mature set of batch job scheduling systems available, thus allowing many batch processes to run without intervention.

ing-point operations per second (MFLOPS), but can come with up to 16 array processors executing over 100 MFLOPS each. PC processors range from 10 MIPS all the way up to 60 plus MIPS. PC processors typically perform between five and 10 MFLOPS. PCs can support several array processors at one time with similar MFLOPS ratings as those attached to mainframes.

MIPS is a very misleading indicator of CPU performance. Mainframe MIPS are usually the equivalent of three or more Intel PC MIPS. Mainframes have instruction sets that were designed to address known computing requirements. Microprocessor instruction sets were originally based on what could be easily etched in silicon and evolved from there. (One of the reasons RISC processors are so successful is that they are designed for performance, they did not evolve into their current form.) Mainframes typically have no wasteful instruction requirements.

Simply reviewing the base performance and capacity numbers between mainframes and PCs give you some idea of the difference in processing power. A mainframe can support hundreds of times the number of peripheral devices, usually disk drives, and can transfer hundreds of times more data per second between these devices than a PC. The mainframe instruction set is designed for performance, and the CPU does not have to be concerned with the details of the I/O in progress. Additionally, up to six CPUs can be tightly coupled for symmetrical multiprocessing (SMP) in a single computer system. When you add it all up you see that a mainframe computer has from 1,000 to 10,000 times the processing capacity of today's PCs.

Operating systems —MVS vs. OS/2

Multiple virtual storage (MVS) is IBM's flagship mainframe operating system. Operating system facilities play a major part in system performance. Some operating systems are designed to optimize interactive terminal performance. Some operating systems are designed to optimize batch job processing. Some operating systems are designed to optimize data transmission processing.

Most operating systems can only do one of these types of processing well. One analogy is fighter airplanes. A fighter can go fast, it can go far, or it can carry a lot of armament, but it cannot do all of them at once. The same is generally true of operating systems. If one type of processing is to be optimized, the other types must be sub-optimized. Alternately, all of the processing types can be sub-optimized so that the operating system can maximize the throughput of the computer system as a whole. In the case of MVS, it is much more complicated. MVS attempts to provide "processing type" (on-line, batch, real-time) optimization, while still maximizing the overall computer system throughput. OS/2 is designed to provide optimum performance for the foreground application. Background applications round-robin through the task scheduler depending on priority indicators.

In addition to the throughput optimization goals, we have the simple fact that the MVS scheduling algorithms have matured over almost 20 years, while OS/2 is less than six years old. And there is more to an operating system than the scheduling facilities.

Communicating dependencies

MVS has a mature set of batch job scheduling systems available, thus allowing many batch processes to run entirely without intervention. OS/2 has several products that provide scheduling functions, but with a large difference in magnitude in comparison to those available for MVS. One example is the magnitude of jobs being managed. It is not unusual for a mainframe to process several hundred batch jobs (jobs consist of one or more programs) each night of the week, and even more on heavy processing nights. The dependencies between jobs can be overwhelming to the novice mainframe programmer.

JOBLIB and STEPLIB vs. LIBPATH and PATH

The use of DLLs within OS/2 is a fundamental advance over DOS. The current OS/2 implementation of DLLs is also a major impediment to progress. Executable code can be shared between processes through the use of the DLL facility, but the separation of the DLL search path from the program search path, while providing a small improvement in overall performance, increases the complexity of the OS/2 execution environment. MVS provides access to programs and DLL type capability through the use of the STEPLIB and JOBLIB commands. These provide the same function as the PATH command in OS/2. Unfortunately, the

OS/2 LIBPATH command is not like the PATH command. The PATH command can be re-executed for each individual process, but the LIBPATH command is static, and is associated with every process, making DLL maintenance difficult in a multi-application environment.

System catalog

The MVS system-catalog facility allows applications to be separated from the location and device type of the files they are processing. Single and multiple volume datasets are processed by the application programs with no difference in program logic. Because of this facility, MVS can easily manage hundreds of thousands of datasets.

OS/2 has no built-in system-catalog facility and multi-volume datasets are not supported. It is also harder to manage datasets, because each reference requires the specification of the drive letter and directory path name. In practice, every application must know exactly where the required datasets reside before they can be processed. It also has no easy facility for tracking the location of all of the existing datasets. (The OS/2 productivity applet "Seek and Scan" is probably OS/2's most frequently used application.)

Under MVS, it is harder to allocate datasets because the general space requirements need to be known in advance. Under OS/2 , it is more difficult to use datasets because the exact location of each dataset must be known.

Development and testing tools

Mainframe development and testing tools are mostly designed to operate in a non-interactive environment, making them clumsy and unyielding to use. OS/2 development tools are designed to work in an interactive environment, and provide the developer with a large degree of feedback. Without a doubt, OS/2 provides a more responsive development environment for the individual, but the design of the LIBPATH command and the lack of a system-catalog facility substantially hinder development efforts. Neither environment exceeds the other in terms of development capacity.

MVS provides a much more complete execution and development environment for corporate applications. OS/2 provides a more interactive user-friendly execution environment for the production application. The question of which is more cost effective, MVS and mainframes or OS/2 and PCs, has to be evaluated case-by-case.

Successful downsizing

Now that the basic attributes of the mainframe (MVS) and PC (OS/2) environments have been covered, I have a list of 15 points to follow when downsizing an application. Many of them are common sense, but remember the definition of a consultant: "someone you pay good money to tell you what you already know." Keep these points in mind when downsizing.

The first 10 points pertain to every downsizing effort. The last five pertain to downsized applications that are integrated with host applications. By the way, failure to adhere to the first three points probably accounts for 99% of all downsizing problems.

1. **First, size the hardware requirements.** Start the project realizing that the puny 30 MIPS mainframe processor has from 1,000 to 10,000 times the processing power of your most powerful PC. Ignore the published performance specifications of the PC platforms and build a benchmark model of your application. Compare the results you get from the different PC platforms under consideration and choose the PC platform with the most "headroom" that you can afford. Remember that even if you don't need it right now, the next release of your application will start eating into your excess capacity.

   I know one company that had an application requiring a complete database refresh every 30 days. Unfortunately, their database design caused the database to take over 30 days to load. A quick benchmark would have identified this problem very early in the project.
2. **Use your existing analysts and programmers.** No one needs much PC expertise on a downsizing project. Keep in mind that PC experts who have not come from the mainframe environment have little appreciation for the constraints of a corporate business system. Existing mainframe MIS staff can easily learn how to program and design for the PC environment.
3. **Use the same languages that you use on the mainframe.** The maintenance costs for any downsized system are going to exceed the development cost by orders of magnitude as the years go by. All of the major languages are available (and stable) on OS/2. If your programmers use COBOL, then your downsized application should be developed in COBOL. The same rule applies to FORTRAN and C. It is not unusual for a company to change languages for their PC development and then find that they cannot keep the maintenance positions staffed.
4. **Use mainframe architectures wherever possible.** For example, now that IBM has released fully functional copies of CICS and DB2 for OS/2, your applications can maintain the same structure and use existing support libraries from the main-

Any OS/2 application that is connected to a mainframe is immediately presented with a bottleneck device —the communications line.

frame. Many other companies have also migrated their products to OS/2. Additional user-friendly features can be added to those downsized applications as the project team gets familiar with building GUI applications. Be smart and start with what you know.

5. **Use your existing development methodologies.** Many people say that development is different under OS/2 than on the mainframe and that the strict rules and procedures of the MIS environment do more to hinder the downsizing effort than to help. My experience is totally the opposite. Development methodologies and procedures allow the development team to stay on course throughout the life of project. Throw them out at your own risk.
6. **Do not reinvent existing technologies.** Buy what you can, build only what you cannot buy. There are three reasons for adopting this philosophy. First, the maintenance costs of anything you build are going to substantially exceed your development cost. Second, mature products almost always have more and better features than you can build in the short amount of time you have available. Third, the purchase price, even when extended over multiple systems, is usually lower than your own internal development costs. However, always keep point Number 1 in mind when reviewing commercial software.
7. **Get a remote-control package for OS/2.** Most downsized applications will be executing on a LAN and will not be local. Realize from the beginning that you will be downloading programs and data files via communication links. Make sure that your design takes into account the application's remote maintenance requirements.
8. **Get a source-management package for OS/2.** Without a source-management package, your OS/2 development effort will become a mass of anarchy, leading to increased costs and decreased reliability. Any source manager is better than none. You cannot run a project without a source manager, regardless of how intelligent or well meaning your team members are.
9. **Get an automated testing tool.** You cannot trust your programmers to adequately test their programs in a systems environment. Get the tool before you start coding and have your development staff use it for everything—including their own unit tests.
10. **Use PC development tools *only* if they will not cause maintenance problems.** Many development tools lock the developer into a proprietary environment. Using PC development tools that only give you a short-term gain is a fools game. Remember that any system you downsize will be around for years and will be undergoing constant refurbishment. Always think about the maintenance cost of the decisions you make.
11. **Remember the communications link.** Any OS/2 application that is connected to a mainframe is immediately presented with a bottleneck device —the communications line. Make sure that your application can be adequately served by the communications line.
12. **Move as little data as possible between the mainframe and OS/2.** Data moving between the mainframe and OS/2 travels up to 1,000 times slower than within the mainframe or the PC. Communications links are much less stable than the other technologies in a downsized system. Whenever possible, your application should be designed to minimize both the amount of data moving between the mainframe and OS/2 and the scheduling dependencies between the mainframe and OS/2.
13. **Identify, understand, and minimize any mainframe to OS/2 dependencies.** Mainframes and PCs involve different scales of time. It is not unusual to move thousands of megabytes of data per hour on a mainframe, but it is very unusual on a PC. So, when a mainframe application has a one-hour window in which a process must be completed, keep in mind that an OS/2 process might not be able to finish within that window. This time-scale difference can really complicate the design and execution of a downsized application.

One application I saw needed to move 750MB between the OS/2 application and the main-

frame application within a three-hour window. With thoughtful design work, it was just barely possible. A quick implementation, without consideration of the effect of the volumes of data involved, or the synchronizing requirements of the mainframe and OS/2 applications, would have resulted in disaster.

14. **Always use transparent mainframe to PC link technology.** This is a variation of rule Number 6. If a product allows you to move data from OS/2 to the mainframe without your applications being aware of the source or target of the transfer, use it. Several available products provide this ability. Even if those products have faults, they are better than anything the average development team can produce in the allotted time.
15. **Don't shy away from home-grown APPC links to your mainframe.** But do not build them if you can buy them. Using IBM's Systems Applications Architecture (SAA) Common Programming Interface Communications (CPI-C) technology, any programmer can create an APPC link from OS/2 to the mainframe. Before you take this step, make sure that the communications link is adequate for the job you are proposing.

When the downsizing development effort starts, it is hard to keep everything in perspective.

The points we just looked at are mostly common sense, and most people already know them. But when the downsizing development effort starts, it is sometimes hard to keep everything in perspective. If you do, you will have no trouble downsizing any application that can fit on your OS/2 system.

Robert Chapman, owner of Chapman and Associates of Aliso Viejo Calif., provides training and consulting services to companies implementing OS/2 solutions to their business needs. He has been consulting for 17 years, and is the author of the best-selling book OS/2 Presentation Manager Programming for COBOL Programmers, *published by QED Publishing Group.*

OS/2 DEVELOPER BACK ISSUES

LIMITED NUMBER OF ISSUES AVAILABLE
The following Back issues of OS/2 DEVELOPER are available for $9.95 each. (Add $2.50 for shipping)

YES, PLEASE SEND ME:

- ☐ Winter 1990, **DOS to OS/2 Conversion**
- ☐ Fall 1990, **Multimedia & Graphics**
- ☐ Fall 1991, **Computer Integrated Manufacturing**
- ■ Winter 1992 **SOLD OUT**
- ☐ Spring 1992, **32-bit Tools**
- ■ Summer 1992 **SOLD OUT**
- ■ Fall 1992 **SOLD OUT**
- ☐ Winter 1993, **Migration Strategies**
- ■ Spring 1993 **SOLD OUT**
- ☐ July/August 1993, **Taligent Spotlight**
- ☐ Sept/Oct 1993, **Networking with OS/2**
- ☐ Nov/Dec 1993, **SOM/DSOM**

Subscribe to OS/2 DEVELOPER for one year and save 33% off the cover price.

YES, PLEASE SEND ME:

- ☐ 1 year (six issues) – $39.95 in the U.S.

Canada, Mexico, and international surface mail—add $16 per year International air mail—add $30 per year

Please check the appropriate boxes on this page and complete the form below, and mail this page to:

OS/2 DEVELOPER
P.O. Box 1079
Skokie, IL 60076-9772
or fax: 415-905-2233
phone: 800-926-8672 (800-WANT-OS2)

Please Print:

NAME

TITLE

COMPANY

ADDRESS

CITY STATE ZIP

- ☐ Check enclosed
- ☐ Charge my credit card:
  - ☐ Visa
  - ☐ Mastercard
  - ☐ American Express

CARD NUMBER

EXPIRATION DATE

SIGNATURE

BACKAD

os/2 Developer

Reader Service No. 29

Faxing from OS/2

Two fax-modem driver products for you to use by ESTHER SCHINDLER

Right now, you might be printing your documents, then hand-carrying them to a fax machine. Instead of wasting all that paper, you can use fax software to print directly to a fax modem. Or, you can create a fax from scratch, using graphics or ASCII text.

Back when I used DOS and Windows, I rarely used my fax modem; when I did, it was with constant fussing. Even though the software claimed to send and receive faxes in the background, it never worked quite right.

Using fax software under OS/2 is another story. Both products reviewed here, SofNet's FaxWorks for OS/2 and Microformatic's Fax/PM, work completely in the background and are wholly non-intrusive.

Instead of wasting paper, you can use fax software to print directly to a fax modem.

During the course of writing this review, I regularly sent, received, and printed faxes while working in word processors and spreadsheets, searching for files on disk, and reading diskette files. Faxing never slowed down my system.

Creating faxes

FaxWorks and Fax/PM both install a fax printer object on the OS/2 desktop. The usual way to send a fax is to select the fax as the active printer in your application, and simply *print*. The fax program captures the output and sends it to the remote fax machine. You are prompted for the recipient's phone number (which you can choose from a phone book) and an optional cover sheet. Both programs support printing from OS/2, WinOS/2, and DOS applications.

You can create a new fax from scratch with either program. In Fax/PM, you can import an ASCII document or a previously-saved fax document (for example, a standard company brochure). FaxWorks will create new faxes from ASCII text, TIFF, and BMP files. Unlike Fax/PM, FaxWorks has no drag-and-drop support. If the entirety of your message is "What you sent is fine, and I recommend no changes," it's easy to send the message on a cover sheet in FaxWorks. To accomplish the same thing in Fax/PM, you must create a custom cover sheet.

Some Windows fax programs provide a library of cover sheets, ranging from the silly to the formal. Neither FaxWorks nor Fax/PM provides such a library. You can not create custom cover sheets in FaxWorks; the most you can do

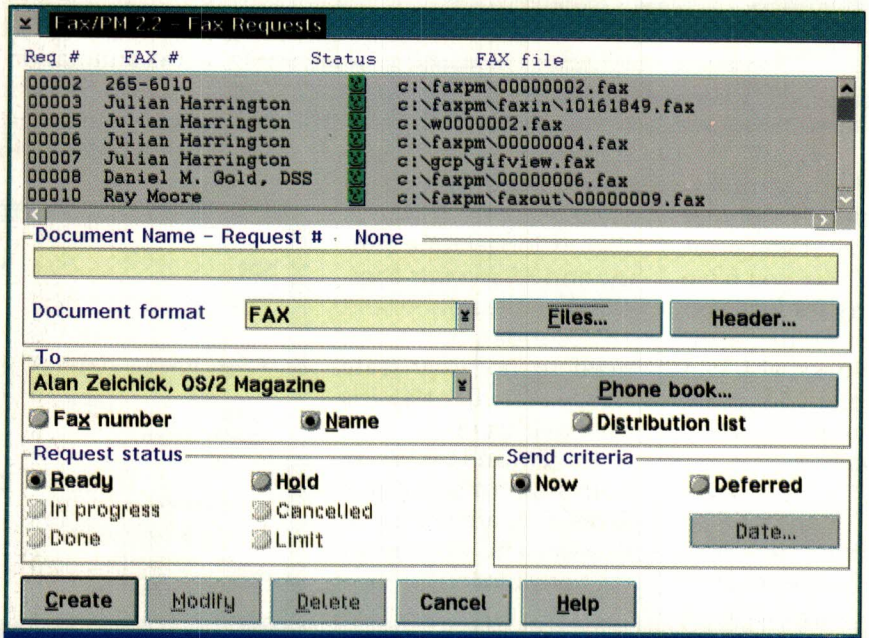


Figure 1: Fax/PM gives you plenty of control over scheduling fax transmissions.

is specify which BMP file to display on the cover page.

Fax/PM supports custom cover sheets, storing each as a separate file. You can use any previously saved fax file as a cover sheet, which provides a lot of flexibility. You can change the field titles that appear on the cover sheet, but you can't add additional fields such as "project number." To use a different cover sheet, you have to change the default setup; it's somewhat awkward, but it works.

It is easy to add, delete, and edit each program's phone book fax-number entries. The number of phone book fields is slightly anemic in both cases (neither program includes a field for a voice phone number, for example). Fax/PM supports more phone number fields, but you can't add a phone book entry on the fly. If you print to fax and discover that you have no phone book entry for Ray, you must enter Ray's fax number manually. Using FaxWorks, you can add Ray's entry while you create the fax. Both programs adequately support distribution lists.

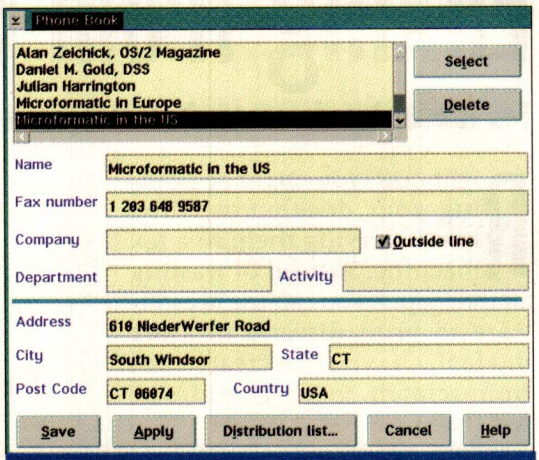


Figure 2: The phone book entry for Fax/PM.

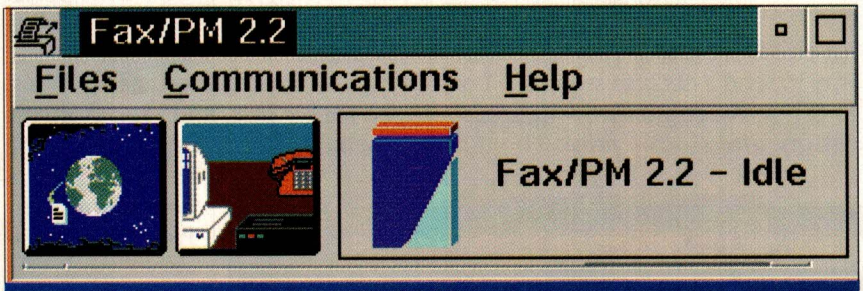


Figure 3: Fax/PM manages to provide a lot of information in a small space.

Sending faxes

I had no trouble sending faxes from either program. Both coped equally well with my equipment (a Practical Peripherals FXSA pocket fax modem and a US Robotics HST Dual Standard fax modem). However, there was a remarkable difference in the quality of the faxes generated by each program.

I sent the identical document over the same modem to the same fax machine. The document I used (the *printer.tst* included with WordPerfect 5.2 for OS/2), includes grey shading on a table heading and on a headline, as well as graphics and font attribute changes. Using FaxWorks, the shaded headings were entirely black. The quality of the fax generated by Fax/PM was significantly better. Sending a document using Fax/PM took slightly longer (one minute and 32 seconds compared to one minute and 18 seconds), but if you need to fax grey-scale images frequently, it's time well spent.

Fax/PM and FaxWorks both support scheduled faxes well, allowing you to select a future time for fax transmission.

Neither program provides an elegant way to fax multiple documents such as a report from DeScribe followed by a spreadsheet graph, in a single transmission. FaxWorks doesn't provide this ability at all; you must send two faxes, one for each document. Fax/PM can send up to three files in one fax transmission, but its method for doing so is clumsy and could be improved.

Receiving faxes

Fax annotation is important if you intend to mark up received faxes and return them to the sender. You can annotate in FaxWorks by typ-

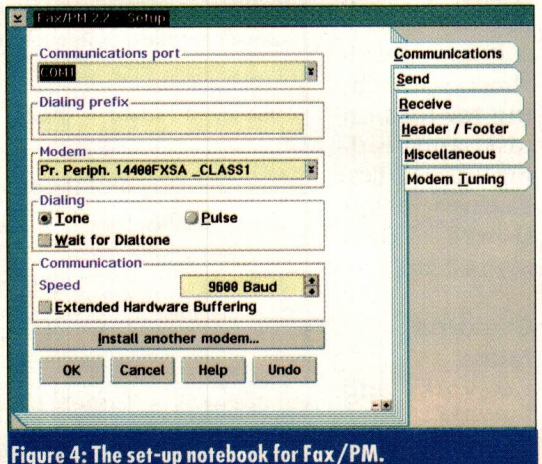
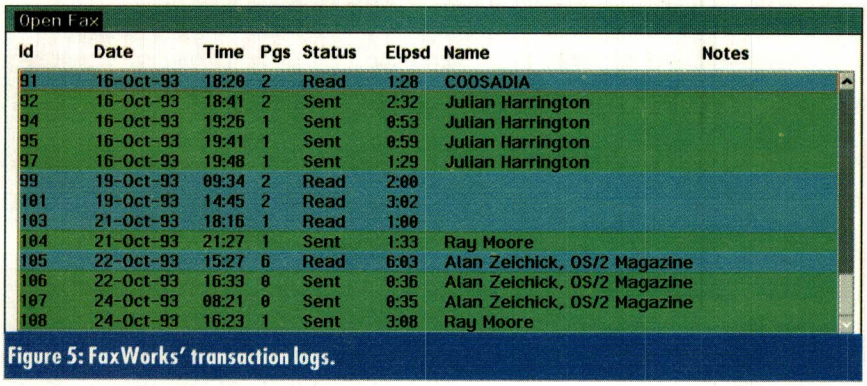


Figure 4: The set-up notebook for Fax/PM.


Open Fax
Id Date Time Pgs Status Elpsd Name Notes
91 16-Oct-93 18:20 2 Read 1:28 COOSADIA
92 16-Oct-93 18:41 2 Sent 2:32 Julian Harrington
94 16-Oct-93 19:26 1 Sent 0:53 Julian Harrington
95 16-Oct-93 19:41 1 Sent 0:59 Julian Harrington
97 16-Oct-93 19:48 1 Sent 1:29 Julian Harrington
99 19-Oct-93 09:34 2 Read 2:00
101 19-Oct-93 14:45 2 Read 3:02
103 21-Oct-93 18:16 1 Read 1:00
104 21-Oct-93 21:27 1 Sent 1:33 Ray Moore
105 22-Oct-93 15:27 6 Read 6:03 Alan Zeichick, OS/2 Magazine
106 22-Oct-93 16:33 0 Sent 0:36 Alan Zeichick, OS/2 Magazine
107 24-Oct-93 08:21 0 Sent 0:35 Alan Zeichick, OS/2 Magazine
108 24-Oct-93 16:23 1 Sent 3:08 Ray Moore
Figure 5: FaxWorks' transaction logs.

cases, is uniformly good. Both packages can be set to print faxes automatically on receipt.

Administrating faxes

FaxWorks and Fax/PM both include transaction logs to help track faxes that are being sent and received. The logs in both programs are adequate but unremarkable. You can easily delete items from the fax logs, but neither makes it especially easy to search, archive, compress, or retrieve a given fax. I found it easier to work with Fax/PM's log, but that may be a matter of preference.

If you have DeScribe and Fax/PM, you can run a mail merge that creates a series of faxes. Instead of the mail merge creating one long document with several letters, the action creates a series of unique letters. Each of these letters is faxed immediately.

FaxWorks sells a separate optical character recognition (OCR) product. Fax/PM has an OCR product in development. Neither module was tested for this review.

Installation and hardware support

To set up the fax printer, both programs take over a printer port.

ing text directly on a fax you receive or by importing an ASCII file or a BMP or PCX graphic. However, what was black in your original PCX image will be white on the fax and vice versa. Once you type onto the fax, it's difficult to move or resize the text.

Fax/PM won't let you annotate a fax directly. Microformatic suggests importing the fax into a word processor as a graphic, annotating it there, and faxing out the resulting document.

Neither Fax/PM nor FaxWorks provides fine-tuned control over viewing the fax documents you send or receive. Both programs, offer a choice of small, medium, or large views, but you can't zoom in on a specific section.

Phone Book Edit
Name Technical Support
Company SofNet, Inc.
Fax number 1 404 984-9956
Group Registration & Support
Change Add Delete New Cancel Help
Figure 6: The phone-book entry for FaxWorks.

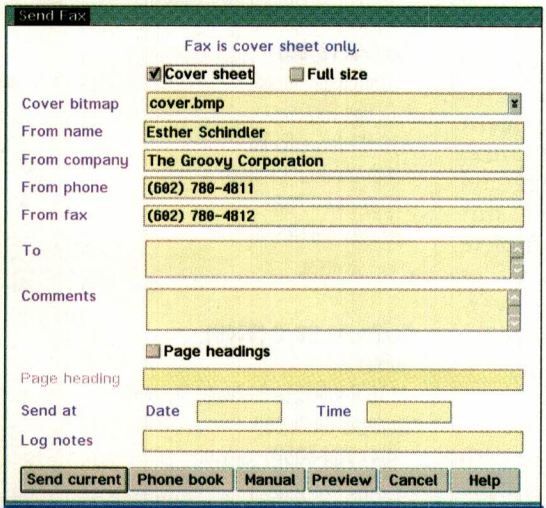


Figure 7: FaxWorks' cover-sheet page.

Both packages performed reliably while receiving faxes. They also start up very quickly. On more than one occasion, I answered the phone to discover that a fax machine was trying to "talk" with me. The programs respond so well that I was able to launch the fax program and tell it to answer the current call before the other fax machine stopped trying

Printing, in both

By my standards, Fax/PM is prettier.

I was a little wary of it at first, because its icons were so cute. (I don't deal well with "cute" at 9 a.m. on Monday morning.)

Ordinarily, this procedure will present no problem. However, I use a Novell network and, in addition to a local printer, I had been using LPT2 and LPT3 to output to the network laser and dot-matrix printers. To use FaxWorks on LPT3, I had to give up the dot-matrix printer. Fax/PM, on the other hand, will install on an unused COM port if all of the LPT ports are allocated, though the manual advises against doing so. I used COM4 for Fax/PM and had little difficulty. The only problem I had was in printing from older DOS applications, such as Q&A, which doesn't support serial-port printing. The program didn't locate COM4, so I couldn't assign the printer to that port.

In both cases, the initial installation is straightforward. However, with FaxWorks, you must reinstall the entire program to change modems.

Both programs support Class-1 and Class-2 fax modems, which covers virtually all currently available equipment. However, Fax/PM does not support fax modems that use the CAS protocol, most notably the Intel SatisFAXion. Other non-CAS fax modems from Intel are supported.

Usability

Ideally, the fax software you choose should be as invisible as possible, requiring a minimum of attention. FaxWorks and Fax/PM have a somewhat different feel. Unfortunately, this "feature" is the hardest one for a reviewer to quantify, as it is subject to personal opinion.

FaxWorks uses an all-in-one approach, with all modules incorporated in a single program. Fax/PM's viewer and scheduler are separate, though you can easily launch the viewer from the scheduler. Their separation is an advantage if your fax and modem share the same phone line. Since the fax scheduler "owns" the COM port, you cannot have another communications program active. With FaxWorks loaded (even just to view or print a fax), I couldn't use a telecommunications program to dial into CompuServe.

By my standards, Fax/PM is prettier. I was a little wary of it at first, because its icons were so cute. (I don't deal well with "cute" at 9 a.m. on Monday morning.) However, Fax/PM's icons are meaningful, using color and expression to make it easy to learn the current fax status. For instance, FaxWorks displays a message saying that it's sending page 1, but Fax/PM says that it's 80% complete sending page 1. Fax/PM's log files and status reports are more verbose, making it easy to determine the cause of a problem.

The fax

Overall, I like both of these programs. If you need to do simple annotations on your faxes, then return them to the sender, or if you have an Intel SatisFAXion modem, then FaxWorks is a better choice. Fax/PM is the clear winner if you send faxes that include a lot of graphics or shading, if you need to perform fax mail merges, or if you need to send faxes that are composed of multiple documents. I personally preferred Fax/PM, based on the number of features it had and its user interface, but neither package will make you unhappy.

Esther Schindler is a computer consultant who writes and teaches about computers. She is vice-president of the Phoenix PC Users Group, and co-coordinator of its OS/2 Special Interest Group. Esther is primary sysop of the ZiffNet Executives On-Line forum, and an outspoken user advocate. You can contact her via CompuServe at 72241,1417.

RESOURCES:

Fax/PM ($150)
Microformatic
P.O. Box 722
610 Niederwerfer Rd.
South Windsor, CT 06074
(203) 644-1708
fax: (203) 648-9587
READER SERVICE NO. 154

FaxWorks OS/2 ($149)
SofNet Inc.
1110 Northchase Parkway, Ste. 150
Marietta, GA 30067
(404) 984-8088
(800) 329-9675
fax: (404) 984-9956
READER SERVICE NO 155.

Late-Breaking Developments in the World of OS/2

Just Announced

Hobbes OS/2 CD-ROM

Download from the Internet on your CD-ROM

Walnut Creek is making available the latest version of their Hobbes OS/2 CD-ROM, dated October, 1993.

The CD ROM is a collection of over 3,000 public-domain and shareware OS/2 programs, icons, fonts, utilities, patches and drivers, collected from the Internet site hobbes.cdrom.com. The disc is in ISO 9660 format and all files are guaranteed by Walnut Creek to be virus free.

The Hobbes CD ROM is available from Walnut Creek and other retailers for $29.95. Walnut Creek can be contacted at (510) 674-0783, fax (510) 674-0821, or via Internet at *info@cdrom.com*.

READER SERVICE NO. 156

Pmcomm 2.11

What's the proper term for terminal program?

Multi-Net Communications announces the latest update to their 32-bit terminal program Pmcomm. Pmcomm offers speeds of up to 115,200 baud, an unlimited number of dialing directories containing up to 300 entries each, and a variety of scripting languages. Ten file-transfer protocols are supported including Zmodem and a variety of CompuServe protocols. This terminal program is full workplace-shell compliant, which allows such features as drag-and-drop downloading.

Multi-Net Communications sells Pmcomm for $59.95 including one year of free upgrades through their BBS. Multi-Net can be contacted at (503) 883-8099.

READER SERVICE NO. 157

Footprint Works for OS/2

Hey Buddy, give me the works

Footprint Software is announcing a five-part works program called Footprint Works. Footprint Works is a 32-bit Workplace Shell program containing word processing, spreadsheet, charting, data filer and reporting modules. This multithreaded application uses a common interface between all of the modules including ribbon-bar icons, floating palettes, and a WYSIWYG display.

Footprint Works requires OS/2 2.x with at least 10MB of hard disk space. Footprint Works for OS/2 is priced at $99. Footprint Software can be contacted at (416) 860-0477 or fax (416) 860-1780.

READER SERVICE NO. 158

IconAuthor 5.1 for OS/2

Author! Author!

AimTech announces that it's cross-platform multimedia authoring tool, IconAuthor 5.1, will now be available for OS/2.

IconAuthor is an icon-based tool that allows end users to create multimedia presentations containing text, graphics, animation, and full motion video. Other versions of IconAuthor include versions for Windows, IBM RS/6000, and various UNIX platforms.

AimTech is selling IconAuthor 5.1 for OS/2 directly for $4,995. The package includes a four-day training course and one year of technical support. AimTech can be reached at (603) 883-0220 or fax (603) 883-5582.

READER SERVICE NO. 159

Back in a Flash! 1.1

How fast is it anyway?

CCT announces the new version of its OS/2-based backup software, Back In A Flash 1.1. Version 1.1 of this 32-bit multithreaded application includes such features as SCSI support, background operation, full support for extended attributes and HPFS. The program also features a "worst case" command-line restore capability, and option-optimized code is available for 486s.

Back in a Flash is available through CCT and resellers for a list price of $89. CCT can be contacted at (612) 339-5870, fax (612) 339-5963.

READER SERVICE NO. 160

The GUI-OOUI War: Windows vs. OS/2

Settle that argument today!

Van Nostrand Reinhold is releasing *The GUI-OOUI War: Windows vs. OS/2, the Designer's Guide to Human-Computer Interfaces*. The author, Theo Mandel, has a Ph.D. in Cognitive Psychology and was a member of the IBM CUA User Interface Group.

The GUI-OOUI War: Windows vs. OS/2 is billed as a book about design principals for user inter-

Just Announced

faces. It covers the advantages and disadvantages of graphic user interfaces (GUIs) and object-oriented user interfaces (OOUIs) using real-world examples.

Van Nostrand Reinhold is selling The GUI-OOUI Wars through book stores for a list price of $29.95. The book is also available for a free 15-day examination direct from VNR by calling (800)544-0550 Dept. Z 3300 or fax (606) 525-7778 or (606) 525-6600..

READER SERVICE NO. 161

Smart-Lock 2.0

Do not disturb!

Corporate Information Management GmbH announces Smart-Lock 2.0, an OS/2 hardware security system. Smart Lock controls access to an OS/2 system by disabling the system until a card is inserted and the right code is entered. The card contains a fingernail-size computer chip with a cryptographic operating system. The 32-bit workplace shell software can also limit access to any part of the operating system to individual users.

Corporate Info Management GmbH can be contacted at +49 8142 598110 or fax +49 8142 54843. Pricing is variable depending on the order.

READER SERVICE NO. 162

OS/2 Videotapes

Learn from a real full-motion video

ViaGrafix, makers of educational computer videotapes, is now selling four tapes about OS/2. The four tapes are titled "Getting Started with OS/2," "Productivity with OS/2," "OS/2 and your LAN," and "Optimizing OS/2 for HOT Performance." All of the video tapes, which are intended for the beginner, cover an average of 20 topics and are also intended for company training.

These videotapes are available direct from ViaGrafix. The prices for the individual tapes vary from $39.95 to $59.95, with all four tapes for $159.95. ViaGrafix can be contacted at (800) 842-4723, (918) 825-6700 or fax (918) 825-6744.

READER SERVICE NO. 163

Window Washer 2.0

Save our screens!

One Up Software announces the latest version of their OS/2 screen saver, Window Washer 2.0, with extended multimedia support. This 32-bit screen saver is customizable so that graphics, digital video and WAV files can be added by the user. Keyboard/mouse password protection and digital audio and video enabling are also possible. The new modules in this release include Enhanced Window Washer and Riding Mower.

One Up Software can be contacted at (800) 678-0187, (214) 620-1123, or fax (214) 620-9626.

READER SERVICE NO. 164

CS-Edit/2

An editor especially designed for that pesky *config.sys*.

Multitask Consulting Ltd. is announcing the first text editor specifically designed to edit the *conifg.sys* statement for OS/2.

The editor makes use of special dialog boxes that make sure that only valid information is entered and restore option to return any variable to their default installation value. Options include the ability to scan the entire *config.sys* for errors upon startup of the editor and automatic backup with every save.

CS-Edit/2 is available for $45. Multitask Consulting in Australia can be contacted at +61-2-904-1988 or fax +61-2-953-9101.

READER SERVICE NO. 165

Digital Series Adapter

SDLC communications get a 64,000 bps boost on ISA computers

Microgate announces the ISA version of its Digital Series Adapter (DSAi). The DSAi, made to link PCs to DSU/CSUs and other DCEs via its v.35 or RS232 interface, is compatible with the IBM SDLC adapter. Running at 65,000 bps, DSAi can run SDLC software such as Communication Manager/2 and OS/2 Entry LAN to LAN Wide Area Network program for Token Ring inter-networking over an SNA backbone WAN.

Microgate will start shipping DSAi in November, and it will sell for $469. For more information contact Microgate at (512) 345-7791 or fax (512) 343-9046.

READER SERVICE NO. 166

Power Translator Professional

Write in a foreign language with no training

Globalink brings mainframe translation power to OS/2 with the release of Power Translator Professional. The OS/2 version of

Just Announced

Power Translator Professional converts text to or from any combination of the following languages: Spanish, French, German, and English. Full-sentence translations of over 20,000 words per hour are possible with 90% idiomatic accuracy. Text can be translated interactively as it is entered, or in batch mode from another source. The general dictionary contains over 250,000 words and additional specialized dictionaries can be created or purchased.

Globalink sells Power Translator Professional for $1,195. The program requires OS/2 2.x, 8MB RAM, and 18MB of hard disk space. Globalink can be contacted at (703)273-5600 or fax (703)273-3866.

READER SERVICE NO. 167

Matrox MGA Video Drivers

Matrox MGA video boards make a 1,600-by-1,200 Workplace Shell possible

Matrox, manufacturer of high-performance video boards, announces new OS/2 drivers for video boards using the 64-bit MGA chipset. The MGA series features a 64-bit chipset, is capable of a 120Hz refresh rate, and a maximum resolution of 1,600x1,200. The OS/2 video drivers are able to handle a maximum resolution of 1,600x1,200 with 8-bit color and 1,280x1,024 at 24-bit color.

The MGA video boards can be equipped with a varying amounts of VRAM and DRAM. The prices range from $599 to $1,999 and the cards are VESA, ISA, MCA, and PCI bus types. Matrox can be contacted at (514) 685-2630 or fax (514) 685-2630.

READER SERVICE NO. 168

XoftWare/32 3.0

Raising OS/2 to the power of X

AGE Logic announces XoftWare/32, an X Server for OS/2. XoftWare/32 brings X Windows support to OS/2 PCs. This software is MIT X11R5-compliant and provides the ability to have a completely interactive Telnet session using either a DEC VT100 or VT220 emulation. It also includes AGE's Network File Manger, a graphical file browser that can display all files on a network and supports the FTP protocol.

XoftWare/32 for OS/2 is available for a single-user list price of $395. ACE Logic can be contacted at (619) 455-8600 or fax (619) 597-6030, e-mail *sales@age.com*.

READER SERVICE NO. 169

SkyScraper

Bring a virtual desktop to your desktop

Binar Graphics announces SkyScraper, a virtual desktop tool for OS/2. SkyScraper features a complete set of desktop-management features. Using SkyScraper's toolbar, it is possible to maximize applications, folders, and work areas on up to 1,024 virtual desktops. Other features include a program launcher, which can customize eight virtual desktops—complete with Windows Size and Open applications. The program is integrated into the Workplace Shell so that drag-and-drop editing can be used to organize objects on the virtual desktops.

SkyScraper is available from Binar Graphics for a retail price of $99. The program requires OS/2 2.0 or better. Binar Graphics can be contacted at (415) 491-4182.

READER SERVICE NO. 170

CPU Monitor Plus

Benchmark and analyze your system as you use it

CPU Monitor Plus from BonAmi Software is a performance monitor and tuning package for OS/2. CPU Monitor Plus graphically displays all OS/2 System statistics and offers the ability to change the priority or terminate any thread or process in real time. Using this information, which is presented with either graphics or text, it is possible to tune individual applications for the best performance.

CPU Monitor Plus works on all OS/2 systems version 1.2 or better. Pricing was unavailable at press time. BonAmi can be contacted at (508) 371-1997 or fax (508) 371-1997 x21.

READER SERVICE NO. 171

CursorPower

Now, where did I put that cursor?

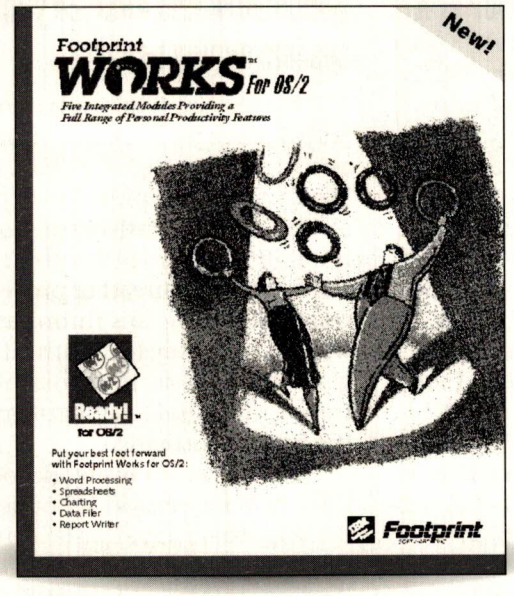
North Shore Systems presents CursorPower, a cursor-editing utility for OS/2. CursorPower allows modification of all forms of the mouse pointer in the OS/2 system. The utility program includes over 100 sample cursors and the Windows and OS/2 versions on one disk. (A special editon of CursorPower is also available specifically for WordPerfect for Windows.) It is also able to import other graphics formats and change the "hot spot" of any cursor you create.

CursorPower is available for a list price of $49.95, and requires OS/2 2.1 or better. North Shore Systems can be contacted at (703) 831-1108 or fax (703) 831-8553.

READER SERVICE NO. 172

Now Available

Footprint
WORKS™ For OS/2
OS/2 32 bit Integratable Modules



Five integrated modules providing a full range of personal productivity features...

- Word Processing
- Spreadsheets
- Charting
- Data Filer
- Report Writer

Footprint Software will make available to corporations and developers

SOM Objects, Source Code & API's

Call Today About Our Cost Effective Solutions for OS/2 Users.

For Information or prices contact Sharon Manuel at

1-800-465-8470

Footprint SOFTWARE INC.

Footprint Software Inc. 53 Yonge St. Toronto, Ont M5E 1J3

Reader Service No. 30

Advertising Index

Reader Service Number	Company	Page
42	All Peripherals	69
10	American Telerep/Microformatic	19
38	Arcadia Technologies Inc.	C3
23	BocaSoft	43
27	Bon Ami	49
28	Business Software Solutions	51
12	Cadware	22
16	Clear & Simple	26
35	Creative Systems Programming	80
20	Describe Inc.	29
17	Development Technologies Inc.	26
30	Footprint Software	66
24	Globalink Inc.	47
37	Gpf Systems Inc.	81
32	Hockware	70
	IBM	20
	IBM	8
7	Indelible Blue, Inc.	13
18	Invictus Systems Corp.	27
21	Levine Computer Consulting	29
9	MHR Software & Consulting	16
3	MSR Development	6
40	Manufacturers Rep	69
	Microgate Corp.	27
39	One Up Corp.	C4
29	*OS/2 Developer* back issues	58
31	OS/2 Directory	69
33	*OS/2 Developer*	74
34	*OS/2 Magazine*	77
1	OS/2 World Conference	C2
22	OS/2 World Conference	34-35
13	PCX	23
8	Proportional Software Corp.	14
41	Rightware Inc.	69
4	SofNet	5
15	SofTouch Systems Inc.	25
2	Soft & Gui	2
25	Softbridge Inc	49
6	Sundial Systems Corp.	11
14	Synetik Systems	24
5	Sytron	10
36	Tritus Inc.	81
19	Van Nostrand Reinhold	28

The information on this page is provided as a service to our readers. The publisher will assume no liability for errors or omissions.

Free Info! Fast!

Free Product Information from *OS/2 MAGAZINE.*

Get valuable facts about products and services that appear in *OS/2 MAGAZINE.* There's no cost and never any obligation to you!

Return the Card Today!

Here's all you do: Write your name and address on the attached card, complete the brief survey, and then circle the numbers on the card that match to ones at the bottom of ads or articles that interest you. (To assure prompt processing, you must answer all survey questions.) Then return the card to us. We even pay the postage! What could be easier?

Return your card TODAY!

OS/2 MAGAZINE

Recycled Paper

Free Product Information from *OS/2 MAGAZINE!* *(Please Print)*

A. What is your involvement with OS/2 and related products at your company? (Please check all that apply)
1. ☐ Approve purchases
2. ☐ Evaluate products
3. ☐ Specify/Recommend brand
4. ☐ Influence or determine need
5. ☐ All of the above

B. When do you plan to purchase any or all of the products circled?
6. ☐ 0–3 months
7. ☐ 3–6 months
8. ☐ 6–12 months
9. ☐ Just gathering literature

C. What is your job function?
10. ☐ MIS/DP Management
11. ☐ MIS/DP Staff
12. ☐ Reseller/VAR/Systems Integrator/ Consultant
13. ☐ Corporate Management/Principle
14. ☐ General Management/Administration
15. ☐ Accounting/Finance
16. ☐ Engineering
17. ☐ Medical/Legal
18. ☐ Marketing/Sales
19. ☐ Purchasing
20. ☐ Other

D. Please indicate number of employees in entire company.
21. ☐ 25 or less
22. ☐ 26–99
23. ☐ 100–499
24. ☐ 500–999
25. ☐ 1000–4999
26. ☐ 5000 or more

☐ **Check here for a 1-year (12 issue) subscription to OS/2 MAGAZINE at $39.95**

OS/2 2-94

Name _____

Title _____

Company _____

Address _____

City _____ **State** _____ **Zip** _____

Country _____ **Postal Code** _____

Phone _____ **Fax** _____

We regret that we can process only 25 selections per card. Offer expires: 5/31/94

1	21	41	61	81	101	121	141	161	181	201	221	241	261	281
2	22	42	62	82	102	122	142	162	182	202	222	242	262	282
3	23	43	63	83	103	123	143	163	183	203	223	243	263	283
4	24	44	64	84	104	124	144	164	184	204	224	244	264	284
5	25	45	65	85	105	125	145	165	185	205	225	245	265	285
6	26	46	66	86	106	126	146	166	186	206	226	246	266	286
7	27	47	67	87	107	127	147	167	187	207	227	247	267	287
8	28	48	68	88	108	128	148	168	188	208	228	248	268	288
9	29	49	69	89	109	129	149	169	189	209	229	249	269	289
10	30	50	70	90	110	130	150	170	190	210	230	250	270	290
11	31	51	71	91	111	131	151	171	191	211	231	251	271	291
12	32	52	72	92	112	132	152	172	192	212	232	252	272	292
13	33	53	73	93	113	133	153	173	193	213	233	253	273	293
14	34	54	74	94	114	134	154	174	194	214	234	254	274	294
15	35	55	75	95	115	135	155	175	195	215	235	255	275	295
16	36	56	76	96	116	136	156	176	196	216	236	256	276	296
17	37	57	77	97	117	137	157	177	197	217	237	257	277	297
18	38	58	78	98	118	138	158	178	198	218	238	258	278	298
19	39	59	79	99	119	139	159	179	199	219	239	259	279	299
20	40	60	80	100	120	140	160	180	200	220	240	260	280	300

Free Product Information from *OS/2 MAGAZINE!* *(Please Print)*

A. What is your involvement with OS/2 and related products at your company? (Please check all that apply)
1. ☐ Approve purchases
2. ☐ Evaluate products
3. ☐ Specify/Recommend brand
4. ☐ Influence or determine need
5. ☐ All of the above

B. When do you plan to purchase any or all of the products circled?
6. ☐ 0–3 months
7. ☐ 3–6 months
8. ☐ 6–12 months
9. ☐ Just gathering literature

C. What is your job function?
10. ☐ MIS/DP Management
11. ☐ MIS/DP Staff
12. ☐ Reseller/VAR/Systems Integrator/ Consultant
13. ☐ Corporate Management/Principle
14. ☐ General Management/Administration
15. ☐ Accounting/Finance
16. ☐ Engineering
17. ☐ Medical/Legal
18. ☐ Marketing/Sales
19. ☐ Purchasing
20. ☐ Other

D. Please indicate number of employees in entire company.
21. ☐ 25 or less
22. ☐ 26–99
23. ☐ 100–499
24. ☐ 500–999
25. ☐ 1000–4999
26. ☐ 5000 or more

☐ **Check here for a 1-year (12 issue) subscription to OS/2 MAGAZINE at $39.95**

OS/2 2-94

Name _____

Title _____

Company _____

Address _____

City _____ **State** _____ **Zip** _____

Country _____ **Postal Code** _____

Phone _____ **Fax** _____

We regret that we can process only 25 selections per card. Offer expires: 5/31/94

1	21	41	61	81	101	121	141	161	181	201	221	241	261	281
2	22	42	62	82	102	122	142	162	182	202	222	242	262	282
3	23	43	63	83	103	123	143	163	183	203	223	243	263	283
4	24	44	64	84	104	124	144	164	184	204	224	244	264	284
5	25	45	65	85	105	125	145	165	185	205	225	245	265	285
6	26	46	66	86	106	126	146	166	186	206	226	246	266	286
7	27	47	67	87	107	127	147	167	187	207	227	247	267	287
8	28	48	68	88	108	128	148	168	188	208	228	248	268	288
9	29	49	69	89	109	129	149	169	189	209	229	249	269	289
10	30	50	70	90	110	130	150	170	190	210	230	250	270	290
11	31	51	71	91	111	131	151	171	191	211	231	251	271	291
12	32	52	72	92	112	132	152	172	192	212	232	252	272	292
13	33	53	73	93	113	133	153	173	193	213	233	253	273	293
14	34	54	74	94	114	134	154	174	194	214	234	254	274	294
15	35	55	75	95	115	135	155	175	195	215	235	255	275	295
16	36	56	76	96	116	136	156	176	196	216	236	256	276	296
17	37	57	77	97	117	137	157	177	197	217	237	257	277	297
18	38	58	78	98	118	138	158	178	198	218	238	258	278	298
19	39	59	79	99	119	139	159	179	199	219	239	259	279	299
20	40	60	80	100	120	140	160	180	200	220	240	260	280	300

Free Info! Fast!

Free Product Information from *OS/2 MAGAZINE.*

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 621 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

OS/2 MAGAZINE
Reader Service Department
PO Box 5308
Pittsfield, MA 01203-9497

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 621 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

OS/2 MAGAZINE
Reader Service Department
PO Box 5308
Pittsfield, MA 01203-9497

Return the Card Today!

Get valuable facts about products and services that appear in *OS/2 MAGAZINE.* There's no cost and never any obligation to you!

Here's all you do: Write your name and address on the attached card, complete the brief survey, and then circle the numbers on the card that match to ones at the bottom of ads or articles that interest you. (To assure prompt processing, you must answer all survey questions.) Then return the card to us. We even pay the postage! What could be easier?

Return your card TODAY!

OS/2 MAGAZINE

OS/2 Marketplace

PARALLEL PORT TAPE BACKUP
the
fastest on the market
OS/2 + DOS + Novell
Sytos Plus software
capacity 250MB to 2GB
Ask for comparison tables

ALL PERIPHERALS, Inc.

Ph. (800) 858-7537
(702) 885-2010
Fax (702) 885-2090

Reader Service No. 42

LinkRight

Transfer files from OS/2 to OS/2 or OS/2 to/from DOS. HPFS, long file names, EA aware. Uses serial, parallel ports. Compatible with LapLink™ cables.

Rightware Inc.,
Phone: (301) 762-1151,
Fax: (301) 762-1185.

Reader Service No. 41

Introducing...
OS/2 Products from One Resource:

MFG'S REP CO.
Call **800 808-4-OS/2**

Word Processing
Spreadsheets
Graphics
Utilities
Networking
Development

Full Service Sales.
We carefully evaluate the software we sell. You get the benefits of our trials!

Mfg's Rep Co. • P.O. Box 7626
Burlingame CA • 94011-7626
Fax (415) 525-2707
Tel (415) 525-2700 or
(800) 808-4-OS/2 [4672]

Reader Service No. 40

Coming in December from the publishers of *OS/2 Developer/Software Development/LAN Magazine/DBMS/Database Programming & Design/Dr. Dobb's Journal/UNIX Review* and IBM Corp.!

OS/2 Solutions-Search Made Easy.

Now the most detailed information available on vendors and applications serving the OS/2 market is all in one place: the IBM OS/2 APPLICATIONS DIRECTORY.

This comprehensive guide leads you to solutions for even the most specialized applications. It keeps developers up to date on the competition and end-users up to speed on what's available and where. Fully detailed listings include:

- Company name
- Contact name
- Address
- Phone number
- Product description
- Details on software features
- Price
- Availability date

Applications are conveniently organized by 17 general industry categories, such as:

- Accounting/personal finance
- Business-specific
- CAD/CADAM
- Development tools
- Electronic mail
- Information management
- Networks

Plus — you get an index of vendors, cross-referenced by product name, and a special separate section of applications certified by IBM's Ready! for LAN Server certification program. Send for your copy of this unique directory today.

OS/2 is a registered trademark of IBM corp.

ONLY $9.95 When off-press in December 1993, send me _____ copies of the **IBM OS/2 APPLICATIONS DIRECTORY** for only US$9.95 each, plus US$3.50 shipping/handling. Add an additional US$2 for shipping to Canada and overseas.

☐ Payment enclosed (include sales tax in CA, GA, IL, NY, & TX; GST in Canada)
☐ Charge my: ___Visa ___MasterCard ___American Express

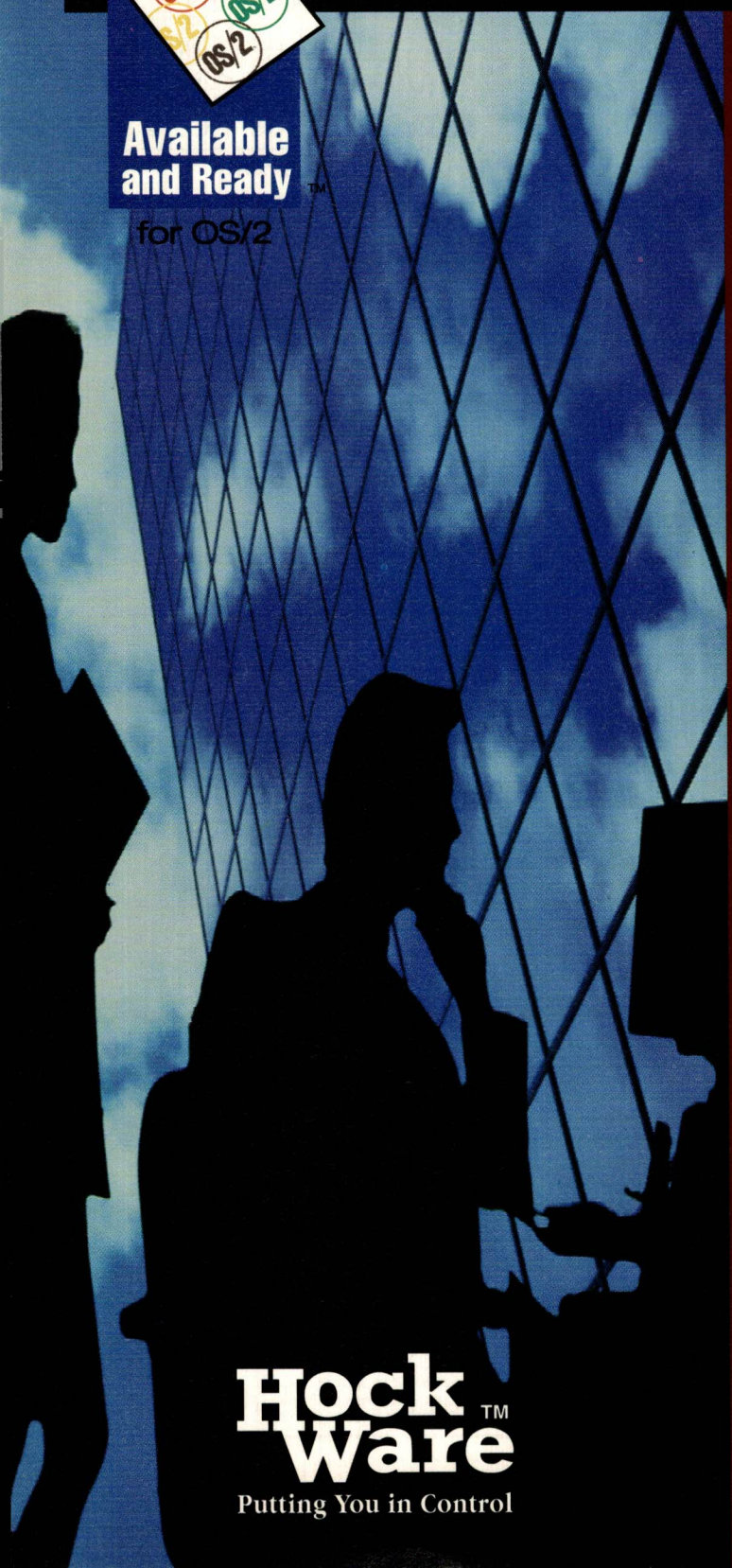
Card # _____ Exp. date _____
Name _____
Company _____
Address _____
City/State/Prov. _____
Zip/Postal Code _____ Country _____
Phone (_____) _____ FAX (_____) _____
Signature (REQUIRED) _____

MAIL TO: Daniel Strickland, OS/2 APPLICATIONS DIRECTORY,
Directory Dept., Miller Freeman Inc., 600 Harrison Street, San Francisco, CA 94107 USA
FAX TO: (415) 905-2239 **OR CALL:** (415) 905-2728

Reader Service No. 31

For OS/2 2.x

UNLEASH THE POWER OF VISPRO/REXX™

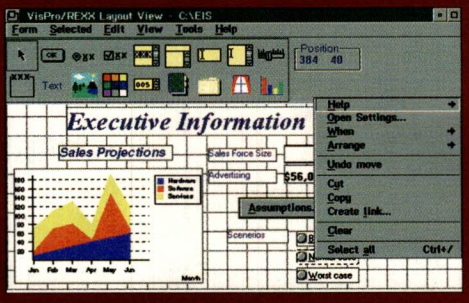


Available and Ready™ for OS/2

Hock Ware™
Putting You in Control

VisPro/REXX is an easy-to-use visual programming environment that gives you the power to create your own OS/2 2.x GUI applications. Fast.

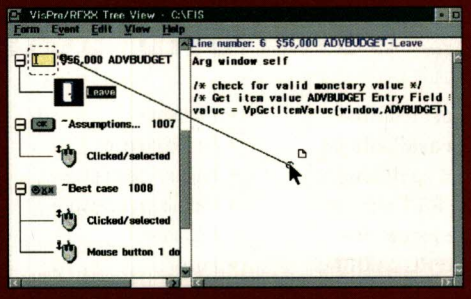
VisPro/REXX features the inherent advantages of Presentation Manager, a Workplace Shell based Project Manager, the Common User Access (CUA) '91 user interface and the SAA REXX programming language.



Design Your Layout

VisPro/REXX offers easy access to OS/2 programming features, including buttons, lists, sliders, charts, business graphics, DB2/2, APPC and EHLLAPI. The upcoming SOM toolkit will allow you to add GUI objects.

Best of all, you don't have to be a REXX expert to use VisPro/REXX: the drag and drop programming feature creates the REXX statements for you.



Drag and Drop to Build Your Program

With VisPro/REXX, you can quickly develop OS/2 CUA '91 applications, build client server programs and generate a single .EXE file of your masterpiece for royalty-free distribution.

UNLEASH YOUR POWER TODAY!

$299 **$99 Bronze Edition**

System Requirements:
OS/2 2.x, 5Mb memory and 1.5Mb hard disk space.

HockWare, Incorporated
P.O. Box 336, Cary, NC 27512-0336
Fax (919) 380-0757 Phone (919) 380-0616

VisPro/REXX is a trademark of HockWare, Incorporated.
OS/2, DB2/2, CUA, SAA and Workplace Shell are registered trademarks of International Business Machines Corp.
© 1993 HockWare, Incorporated. All rights reserved.

Reader Service No. 32

More REXX Basics

JUST *DO* IT WITH LOOPS

BY ALEX LANE

The REXX programs discussed in this column so far have been simple and straightforward. Execution starts with the first line of the program and goes on to the end one line at a time. This sequential execution is basic, but it's also limited and won't help with problems that involve performing a task repetitively. For example, if we wanted to print the word "Hello!" on the screen five times, we could write the following code:

```
/* HELLO5.CMD */
say "Hello!"
say "Hello!"
say "Hello!"
say "Hello!"
say "Hello!"
```

That's not very imaginative, but it does the job. But what if we had to print "Hello!" a thousand times, or a million times? Or worse, what if we don't know how many times to print "Hello!" until after the program is running? In situations like these sequential execution just won't do.

Do it!

The REXX **do** instruction is the answer to our repetition problem. The following code prompts the user to input the number of times the computer should print "Hello!" at run-time:

```
/* HELLO5D.CMD */
```

What if I had to print "Hello!" a thousand times, or a million times?

```
say 'Enter the number of times
to print "Hello!":'
parse pull number
do number
 say 'Hello!'
 end
```

The first two lines, which should be familiar from last month's column, prompt the user to enter a number, the number is parsed from the input and assigned to the variable **number**.

The next three lines are a **do** instruction. These lines tell REXX to evaluate **number**, and then execute the statements in the **do** loop as many times as indicated. The **do** loop is the line between **do number** and the associated **end** keyword. From now on, we'll call the statements in the **do** loop the body of the loop.

Do it with control!

Using the loop number as an index is a technique commonly used when looping. For example, if you wanted to print a multiplication table for a number, the first time through, you'd want to print the number multiplied by one; the second time, the number multiplied by two; to be continued up to a specified limit. The following code prints the product of a number multiplied by the integers from one to 12:

```
/* MULT.CMD */
say 'Enter a number:'
parse pull n
do i=1 to 12 by 1
 say n "x" i "=" n*i
 end
```

In this **do** instruction, **i** is the loop's "control variable." The variable **i** is assigned the specified initial value of one, after which the body of the **do** loop is executed and the value of **i** is incremented by one. This procedure continues until the value of **i** exceeds 12, at which point the loop terminates. Despite being a control variable, **i** is also an ordinary REXX variable. If, for example, you insert the line **i=11** just before the **end** statement, you'll find that the output will consist of just two lines, where **i=1** and **i=12** (remember, the control variable is incremented at the *end* of the body!).

By default, **do** instructions increment the control variable by one, so really, it's sufficient to write the code to read:

```
do i=1 to 12
```

You'll often see this syntax in working code. However, the ability to specify the increment can be useful. For example, if we wanted to print the table from 12 down to one, the first line of the **do** instruction would look like this:

```
do i=12 to 1 by -1
```

However, if we wanted to print only the odd values of the table in ascending order, the first line of the DO instruction would read:

```
do i=1 to 12 by 2
```

and **i** would take on the values 1, 3, 5, 7, 9, and 11 before the loop terminated.

The execution of a loop can be further controlled by using the **for** keyword. For example, using the preceding example, if we wanted to print only the first four values of the table, we could figure out by hand that the line of code ought to read:

```
do i=1 to 7 by 2
```

or, we could simply edit the existing line to read:

```
do i=1 to 12 by 2 for 4
```

to get the desired output.

For the moment, this is enough to get us started with **do** instructions. We'll come back from time to time to fill in our understanding of the syntax of this basic instruction.

Decisions, decisions

Sequential execution is ideal for tasks that can be described in a straightforward manner. Looping execution excels at repetitive chores. A third basic execution method involves evaluating some condition (as in "does a=3?" or "is today Tuesday?") and then selecting code to execute based on the outcome.

This is what the REXX **if** instruction is designed to do. **if** instructions mirror the way we think. For example, "If I have the price of a ticket (or more), I'll go to a movie." Paraphrased in REXX this would read:

```
/* MOVIE.CMD */
say 'How much money do you
 have?'
parse pull cashOnHand
say 'What is the price of a
 movie ticket?'
parse pull ticketPrice
if cashOnHand >= ticketprice
then
 say 'go to movie'
```

In this example, the expression **cashOnHand >= ticketPrice** is either true or false (in REXX terms, it evaluates to either one or zero, respectively). If it is true, REXX executes the instructions following **then**; if it's false, REXX skips the **then** statement and resumes execution at the first line after the **if** instruction.

You can have multiple statements in the **then** part of an **if** instruction, however, the first line of the group must be preceded by the keyword **do** and the last line of the group must be followed by the keyword **end**. This is called a simple **do** group. This construct merely groups a number of statements together and is often used in con-

Bulletproofing code

Last month, we worked with the following program:

```
/* THIRD.CMD */
say 'Enter x and y (with a space between the two):'
parse pull x y
say x 'raised to the power' y 'is' x**y
```

We noted that if you entered <3> the program wouldn't work because **y** isn't assigned a value, and if you entered <3 4 5>, it wouldn't work because **y** is assigned the value <4 5>. And an input like <joe smith> results in an error because the values assigned to **x** and **y** aren't numbers. Although the errors caused by bad input are harmless, good code writers should try to anticipate bad input and write the code to handle it appropriately. Here's how we can make the code more "bulletproof" using if statements and a built-in REXX function:

```
/* THIRDPLS.CMD */
say 'Enter x and y (with a space between the two):'
parse pull x y
if DATATYPE(x) = NUM and DATATYPE(y) = NUM then
 say x 'raised to the power' y 'is' x**y
else
 say 'bad input, try again with two numbers only
```

Here, we use an **if** instruction to determine whether to perform the calculation or not. The condition requires us to make two calls to a built-in REXX function called datatype.

If you're not familiar with functions, think of them as "magic boxes" you can put specific information in, to output desired information. In this case, we give datatype the values of the variables **x** and **y**. **DATATYPE** then indicates whether or not they are numbers. If they are numbers, **DATATYPE** returns the value **num** (otherwise, the value **char** is returned). The **and** in the condition means that both function calls to **DATATYPE** have to return **num.** If both **x** and **y** are numbers, the calculation can be performed. If either of the variables is not a number, the program tells the user there is a problem with the input and suggests a solution.

junction with **if** instructions. In the following example, I've arbitrarily added a couple of lines to our **if** instruction:

```
if cashOnHand >= ticketPrice
then do
 say 'go to movie'
 say 'buy a ticket'
 say 'take a seat'
 end
```

If you remove the **do...end** syntax that groups the three **say** statements together, you'll find that the program always outputs the **'buy a ticket'** and **'take a seat'** lines, regardless of the number entered in response to the prompt. Without the **do...end** syntax, REXX considers the **if** instruction to end with the line **say 'go to movie'**. If the condition is false, that line is skipped and execution continues with the line: **say 'buy a ticket'**. If you find your REXX programs responding strangely, a missing **do...end** may be your problem.

The **if** instruction lets us specify code to execute when the condition is true; we can also specify code to execute if the condition is false. This procedure is taken care of by the **else** clause. We'll revise the **if** instruction in our example to show how the **else** clause can be used:

```
if cashOnHand >= ticketPrice
then do
 say 'go to movie'
 say 'buy a ticket'
 say 'take a seat'
 end
else
 say 'go home'
```

If **cashOnHand** is less than **ticketPrice**, the output tells us to go home. The same rules for **do..end** apply for **else** clauses as before.

If instructions can be nested, which means you can place one **if** instruction inside another one. Here's a simple example of nested **if** instructions:

```
if cashOnHand >= ticket price
then do
 say 'go to movie'
 say 'how much does popcorn
cost?'
 parse pull pcPrice
 if cashOnHand - ticketPrice
>= pcPrice then
   say 'buy some popcorn'
 end /* do */
```

Paraphrased back into English, this code says: "If I have the price of a ticket (or more), go to a movie. If the cash in excess of the ticket price is enough to pay for popcorn, buy popcorn." You've probably noticed the **/* do */** comment added to the **end** keyword. This comment tells us that we're at the end of a **do...end** grouping, which could prevent confusion when we go back to look at this code later. Adding an appropriate comment after the **end** keyword is a good habit to adopt to help keep the code readable.

Too many IFs...

Often, situations arise where you have not just two, but several alternatives available, depending on a condition. In such cases you could use a series of nested **if** instructions. The following is an example of code that determines a letter grade based on a numerical mark:

```
/* GRADE.CMD */
say 'Enter a numerical grade:'
parse pull grade
if grade >=94 then
 say 'grade is A'
else if grade >= 88 then
  say 'grade is B'
 else if grade >= 82 then
    say 'grade is C'
    else if grade >= 76 then
     say 'grade is D'
     else
      say 'grade is F'
```

If you find your REXX programs responding strangely, a missing do...end may be your problem.

Although this code does the job, it's hard to read. The harder code is to read, the easier it is to introduce errors when any serious modifications are made. Instead of using all these nested **if**s, we should use REXX's **select** instruction. The same **if** code expressed as a **select** instruction looks like this:

```
select
 when grade >= 94 then
  say 'grade is A'
 when grade >= 88 then
  say 'grade is B'
 when grade >= 82 then
  say 'grade is C'
 when grade >= 76 then
  say 'grade is D'
 otherwise
  say 'grade is F'
end /* select */
```

That's it! Well, not really. There's much more to REXX than can be covered in just two columns; although, we've introduced enough of the REXX language to do sequential processing, looping, and branching. Using these three basic execution methods, you can write any computer program!

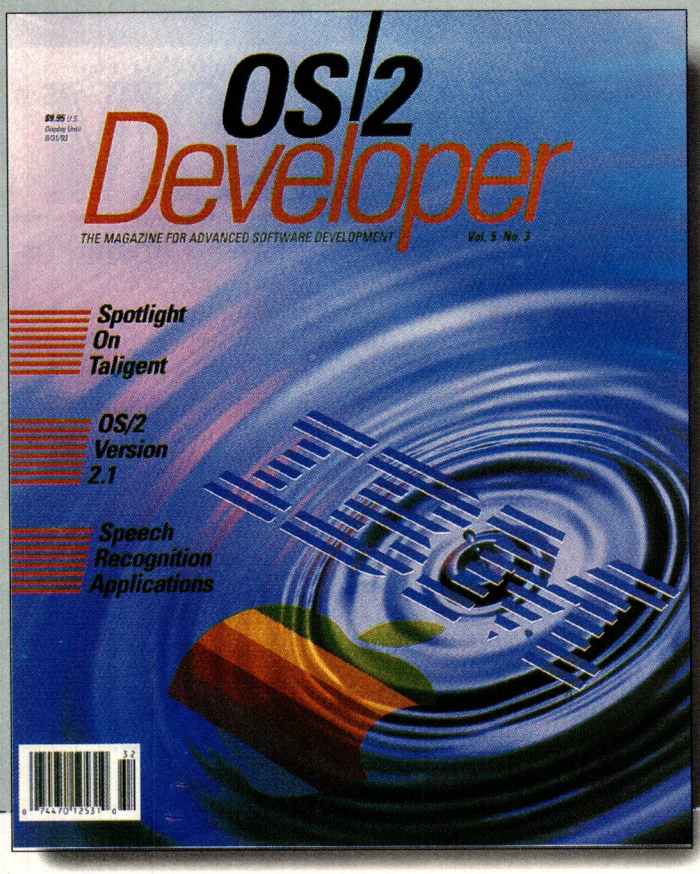
Happy REXXing!

Alex Lane is a Colorado-based consultant and writer and a contributing editor to Software Development *magazine and* AI Expert *magazine. He can be reached via CompuServe as 75715,1370 or via Internet as 75715.1370@compuserve.com.*

DON'T MISS OUT

on a single issue of OS/2

OS/2 Developer offers tips and techniques for more efficient computing for the advanced software developers who have recognized the need for 32-bit power.



TO ORDER

For new orders & customer service:

1-800-WANT-OS2

(1-800-926-8672)

or

708-647-5960

FAX 708-647-0537

Written subscription orders:

OS/2 Developer

P O Box 1079

Skokie, IL 60076-8079

Make checks payable to Miller freeman, Inc. Foreign orders must be in U.S. funds. Please allow eight weeks for subscriptions to begin.

Subscription rates for 6 issues:

- ☐ U.S. — $39.95
- ☐ Canada — $55.95 International surface mail
- ☐ International air mail — $69.95
- ☐ Check inclosed

Charge my: ☐ Visa ☐ MasterCard ☐ AmEx

Card # _____

Exp. Date _____

Signature _____

Name _____

Company _____

Address _____

City/State/Zip _____

Reader Service No. 33

Peer-To-Peer Networking

OS/2 MEETS WINDOWS FOR WORKGROUPS

MATT TRASK

Peer-to-peer is to Networking as Personal is to Computing. Large server-based LAN products, such as Novell's NetWare, have the advantage of centralized control, administration, and backup. These features may help MIS directors to sleep better at night, but they don't do much for the individual computer user. Peer-to-peer networking gives a degree of flexibility and local control that traditionally has not been available to LAN users.

There's been a lot of talk lately about using peer-to-peer networking in business environments as an alternative to server-based networks. OS/2's native networking product, LAN Server 3.0, can be used to set up an OS/2 LAN for either mode of operation. But what about adding OS/2 systems to an existing Windows LAN?

My company has been using Windows for Workgroups (WfWg) for nearly a year as the main network in a software development group with 14 workstations. A few months ago, we took down our Novell server and installed WfWg on it, which allowed us to use Stacker to increase its disk space from 800MB to 1.6GB. This option isn't viable for businesses that depend on server-based applications but we only use the LAN file server as a shared source-code repository.

I travel frequently, and depend on my ThinkPad to keep me connected to the world. When I return to the office, I install the ThinkPad in a docking station and connect it to the LAN. Certain applications, such as e-mail and my Ascend daily planner, must remain on the laptop's disk so they are immediately accessible when I travel. Before we installed a peer network, I was required to copy entire subdirectories to a file server and then recopy them to the laptop—a process that had to be repeated in reverse upon returning. This problem was solved by using WfWg to share my laptop's disk so that the applications could be run on my faster desktop system when I'm in the office. I also use a SCSI tape drive on the desktop PC to perform backups of the ThinkPad's disk.

There's been a lot of talk lately about using peer-to-peer networking as an alternative to server-based networks

But what about OS/2? When I decided to run OS/2 full time on my desktop PC, I was faced with the challenge of making it operate with the same functionality I expected from Windows, including running Ascend and e-mail from the laptop's disk. In addition, the laser printer attached to my desktop system must continue to work as a shared resource. This meant finding a peer networking product that would interoperate cleanly with WfWg.

WfWg itself was not an option because its networking functionality is provided by a collection of Windows Virtual Device Drivers (VxDs) and Win-OS/2 offers no support for VxDs. Other peer products, such as LANtastic and NetWare Lite, can be persuaded to work with OS/2, but with restricted functionality. Most of these products run in a single DOS session and do not provide network services to OS/2 or Win-OS/2 sessions.

My first attempt was a false start—I spent days wading through a collection of large boxes known as OS/2 Extended Services. The word "Ethernet" is mentioned often enough in the enclosed manuals to indicate that it may be a solution, but don't be fooled—Extended Services is only intended for connecting OS/2 systems to mainframes and other enterprise solutions.

IBM's LAN Server 3.0 is the solution I was seeking. It provides both Server and Requester components, permitting proper peer operation and has the additional advantage that like WfWg it uses NetBEUI as its native transport protocol. This

seemed to indicate that I would be able to interoperate seamlessly with other nodes on my WfWg LAN.

The installation went smoothly enough after I located a supported network adapter. Be aware that if you try this solution, you will have to select the Domain Server option if no other LAN Server system is installed on your LAN. The standard commands NET VIEW, NET USE, and NET SHARE worked to map to my disk drives and printer. The server naming conventions don't map directly between LAN Server and WfWg, so you'll have to type out the server names rather than using WfWg's File Manager to visually browse the network.

I found that typical network applications such as Microsoft Mail work fine with this new setup. The networked Hearts game included with WfWg does not work—it uses NetDDE to communicate with other peer nodes and NetDDE is not supported by Win-OS/2. Shared disk and print services work as expected.

The only problem I discovered was with the strategy used by LAN Server to map domain-level security onto WfWg's share-level security. Any user who is planning to use shared resources from the OS/2 system must have a login account created with LAN Server's User Profile Management program. The login name and password must match the name and password that are used to log into WfWg or shares won't work correctly.

Now that I've got my OS/2 system operating as a peer in a Windows network, it is time to ask the difficult question: Is this a good solution? And the answer is: No, of course not. LAN Server 3.0 is a fine server product but is priced to compete with other server-based LAN systems. The entry-level product costs $716 and the advanced LAN Server with HPFS support costs $2,066. Contrast this price with that of products such as NetWare Lite, LANtastic, and WfWg, and you'll see that there's no contest—they range in price from $50 to about $150.

A successful peer-to-peer network is designed to simplify administration, use minimal RAM and disk space, and must support a wide variety of common network adapters

In addition to its high price, other drawbacks include LAN Server's disk (over 10MB) and RAM (over 12MB) requirements are beyond what is reasonably available on many desktop OS/2 systems. It's also difficult to administer, and has support for a limited number of network adapters. I'm not bashing LAN Server, I asked it to perform a task that it was not originally designed to perform. I am just pointing out what I believe are strong requirements for a native OS/2 peer-networking solution.

A successful peer-to-peer network is designed to simplify administration, use minimal RAM and disk space, and must support a wide variety of common network adapters. Both WfWg and LANtastic are excellent examples of peer networks and indicate what is needed for an OS/2 peer network. Perhaps IBM could build a subset of LAN Server that retails for around $50 and does all this. Rumor has it IBM is working with Symbotics to develop a peer networking product that should be available in early 1994. I sincerely hope that this product will work seamlessly on my Windows network so I can reclaim the disk and RAM space currently being consumed by LAN Server.

Matt Trask is the President of Communica Inc., a system software development firm based on Cape Cod, Mass. that specializes in Device Drivers for OS/2 and other advanced Operating Systems. Trask can be reached on the Internet as matt .trask@bix.com.

RESOURCES:

ALN Server 3.0
IBM LAN Systems
11400 Burnet Rd.
Austin, TX 78758
(512) 823-0000
READER SERVICE NO. 173

LANtastic
ARTISOFT Inc.
691 East River Rd.
Tuscon, AZ 85704
(602) 293-4000
READER SERVICE NO. 174

Netware Lite
122 E. 1700 South
Provo, UT 84606
(801) 429-5900
READER SERVICE NO. 175

Stacker
Stac Electronics
5993 Avenida Encinas
Carlsbad, CA 92008
(619) 431-7474
READER SERVICE NO. 176

Windows for Workgroups
Microsoft Corp.
One Microsoft Way
Redmond, WA 98052
(206) 882-8080
READER SERVICE NO. 177

HARNESS THE POWER OF OS/2

INTRODUCING OS/2 MAGAZINE

Make the most of your PC with *OS/2 Magazine!* Every issue brings you the information you need to achieve maximum performance. From your hardware and software, to your operating system and peripherals.

OS/2 Magazine helps you harness the power of your PC. Why not flip open the next issue to timely feature articles like these:

- Common OS/2 problems and how to solve them
- How to detect OS/2 viruses—and keep your data safe
- Putting your OS/2 PC onto a local-area network
- Making multimedia applications come alive under OS/2
- Running Windows applications under the Workplace Shell

You'll also get hands-on tutorials. Expert technical advice. And unequivocally, unbiased product reviews— on HP LaserJets, S3 graphic boards and Intel fax modems, to name a few. Plus the latest news on OS/2, invaluable network support and more.

Reader Service No. 34

SEE FOR YOURSELF

First issue FREE! Check out the next issue of *OS/2 Magazine*. It's on us. If you like it, you can get a full year's worth (11 additional issues) for the low charter rate of $29.95. You'll save 25% off the regular subscription rate!

Why not return the attached form today? You have so much to gain, and *absolutely* nothing to lose!

SPECIAL INTRODUCTORY OFFER!

OS/2 MAGAZINE

YES! Send me a complimentary copy of *OS/2 Magazine*. If I like it, I can get a full year's worth (11 additional issues) for the low charter rate of $29.95. I save 25% off what regular subscribers pay. If *OS/2 Magazine* is not for me, I'll simply write "cancel" on your invoice and that will be that. I owe *nothing*. I lose *nothing*. And the FREE issue is mine to keep.

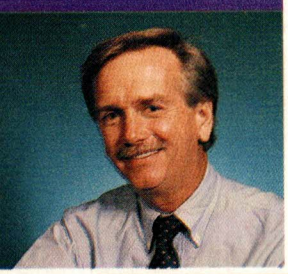
NAME

ADDRESS

CITY/STATE/ZIP

Mail your order to: *OS/2 Magazine*, P.O. Box 56664, Boulder, CO 80323-6664, or call (800) 765-1291, or Fax (415) 905-2233.

Allow up to 6-8 weeks for delivery of your first issue. Canadian/Mexican subscribers please add $10 for surface mail: overseas add $40 for airmail. Prepayment drawn in U.S. dollars on a U.S. bank for foreign orders.



OS/2 Books

CURRENT AND PLANNED FOR 1994 BY DICK CONKLIN

Publisher/Title	ISBN	Author(s)	Level
Abacus: (800) 451-4319, (616) 698-0330			
OS/2 2.1 Complete	1-55755-184-7	Franken	B/I
Stepping up to OS/2 2.1	1-55755-185-5	Albrecht, Plura	B
OS/2 2.1 Bible	1-55755-174-X	Albrecht, Plura	I/A
Addison-Wesley: (800) 882-6339, (617) 944-3700			
Design of OS/2 2.0	0-201-54899-5	Deitel, Kogan	A
Design of OS/2, Second Edition (1994)	0-201-52886-X	Kogan, Deitel	A
C F S Nevada Inc.: (702) 732-9616			
REXX Reference Summary Handbook	N/A	Goran	B/I/A
Computer Information Associates: (708) 766-4677			
OS/2: The Workplace Shell - User's Guide & Tutorial for Rel. 2.0	1-881435-47-4	Tyne	B/I/A
DDC Publishing: (800) 528-3897, (212) 683-9028			
Quick Reference Guide for OS/2 2.1	1-56243-119-6	Lynch	B/I
IDG Books: (800) 762-2974 (415) 312-0600			
OS/2 for Dummies	1-878058-76-2	Rathbone	B/I
OS/2 Secrets (1994)	1-56884-084-5	Patton	I/A
MIS Press: (800) 628-9658, (212) 886-9261			
User Interfaces in C and C++ for OS/2	1-55828-271-8	Goodwin	I
Teach Yourself OS/2 2.1	1-55828-282-3	Fernandez	B
McGraw-Hill: Osborne: (800) 227-0900, (510) 549-6600			
OS/2 Inside & Out (2.1)	0-07-881871-0	Ivens, Proffit	B/I
OS/2 2.1 Programming	0-07-881910-5	Schildt, Goosey	A
McGraw-Hill: Windcrest: (800) 722-4726, (609) 426-7070			
OS/2 Extra	0-8306-4567-5	Dorfman, Neuberger	B/I
Instant OS/2: Porting C Applications to OS/2	0-8306-4522-5	Dorfman	I/A
OS/2 Batch Files To Go	0-07-052370-3	Richardson	I
McGraw-Hill: Professional Computing: (800) 722-4726 (609) 426-7070			
OS/2 Connectivity & Networking	0-07-032696-7	Johnston	I/A
Writing OS/2 REXX Programs	0-07-052372-X	Richardson	I/A
Ultimate OS/2 Programmer's Manual (1994)	0-07-043972-9	Mueller	I/A
Effective Multithreading in OS/2 (1994)	0-07-017841-0	Dorfman, Neuberger	I/A
Cross-Platform Programming for OS/2 (1994)	0-07-017862-3	Dorfman	I/A
Peachpit Press: (800) 283-9444, (510) 548-4393			
Little Book of OS/2, 2.1 Edition	1-56609-047-4	Nelson	B/I
Premier Publishing: (203) 378-6200			
OS/2 Application Development Tools	1-881899-00-4	Proffit	A
Prentice-Hall: Alpha: (800) 428-5331, (317) 581-3500			
Ten Minute Guide to OS/2 2.1, 2nd Edition	1-56761-185-0	Tyson, Oliver	B/I
Prentice-Hall: New Riders Publishing: (800) 428-5331, (317) 581-3500			
OS/2 for Non Nerds	1-56205-153-9	Hallberg	B/I
Maximizing OS/2	1-56205-118-0	Little, et al	I/A
Inside OS/2 2.1, Third Edition	1-56205-206-3	Minasi, et al	B/I
OS/2 in the Fast Lane (2.1 Edition)	1-56205-126-1	Camarda	I/A
Prentice-Hall: Que: (800) 428-5331, (317) 581-3500			
Easy OS/2	1-56529-145-X	O'Hara	B
OS/2 2.0 Application Design Guide	1-56529-157-3	IBM	I/A
OS/2 2.0 Control Program Programming Guide	1-56529-154-9	IBM	I/A
OS/2 2.0 PM Graphics Programming Guide	1-56529-156-5	IBM	I/A

Publisher/Title	ISBN	Author(s)	Level
OS/2 2.0 PM Programming Guide	1-56529-155-7	IBM	I/A
OS/2 2.0 Quick Reference	1-56529-068-2	Nance	B/I/A
Object Oriented Interface Design Guide	1-56529-170-0	IBM	I/A
Using OS/2 2.1 Special Edition	1-56529-118-2	Nance, et al	B/I/A
OS/2 2.1 Red Book for Developers	1-56529-287-1	IBM	I/A
OS/2 2.1 Red Book for Power Users	1-56529-286-3	IBM	I/A
Using OS/2 2.1, Third Edition (1994)	1-56529-635-4	Nance, et al	I/A
Prentice-Hall: Sams: (800) 428-5331, (317) 581-3500			
Real World Programming for OS/2 2.1	0-672-30300-0	Blain et al	I/A
OS/2 2.1 Unleashed	0-672-30445-7	Moskowitz, Kerr	I/A
Your OS/2 2.1 Consultant	0-672-30317-5	Tyson	I/A
Teach Yourself OS/2 2.1 in a Week	0-672-30360-4	Thomas	B/I
OS/2 2.1 Unleashed, Special Edition	0-672-30445-7	Tyson	I/A
Random House: (800) 733-3000, (410) 848-1900			
Van Wolverton's Guide to OS/2, Version 2.1	0-679-74877-6	Wolverton, Meade	B/I
Dvorak's Guide to OS/2 2.1	0-679-74648-X	Dvorak et al	B/I/A
OS/2 2.1 Workplace Shell Programming	0-679-79162-0	Maruzzi	I/A
Sybex: (800) 227-2346, (510) 523-8233			
OS/2 2.1 Instant Reference Book	0-7821-1179-3	Dyson	B/I/A
OS/2 Secrets & Solutions	0-7821-1281-1	Dyson	B/I/A
Van Nostrand Reinhold: (800) 544-0550, (606) 525-6600			
COBOL Presentation Manager Programming Guide	0-442-01293-4	Dill	I
Client/Server Programming with OS/2 2.1, 3rd Edition	0-442-01833-9	Orfali, Harkey	A
Comprehensive Database Performance for OS/2 2.0's Ext. Services	0-442-01325-6	Tate et al	A
Learning to Program OS/2 2.0 PM By Example	0-442-01292-6	Knight	I
OS/2 2.0 Handbook	0-442-01234-9	Zack	I
OS/2 2.X Notebook: Best of OS/2 Developer Magazine	0-442-01522-4	Conklin	A
OS/2 Application Solutions	0-442-01445-7	IBM	B/I
OS/2 Presentation Manager GPI Graphics	0-442-00739-6	Winn	A
OS/2 Systems Migration Considerations	0-442-30897-3	IBM	I
Shell Collection: OS/2 2.1 Utilities	0-442-01585-2	Levenson	I
Using Workplace OS/2: Power User's Guide	0-442-01590-9	Brown, Howard	I
Writing OS/2 Device Drivers in C, 2nd edition	0-442-01729-4	Mastrianni	A
OS/2 2.1 Corporate Programmer's Handbook	0-442-01598-4	Scholin, et al	A
Now That I Have OS/2 2.1 on my Computer-What Do I Do Next?	0-442-01832-0	Levenson, Hertz	B
OS/2 2.1 REXX Handbook: Basics, Applications & Tips	0-442-01734-0	German	I
Windows vs. OS/2: The GUI-OOUI War	0-442-01750-2	Mandel	I
Client/Server Survival Guide With OS/2	0-442-01798-7	Orfali, Harkey	A
OS/2 Remote Communications: Async. to Sync. (1994)	0-442-01814-2	Stonecipher	I/A
OS/2 V2 C++ Class Library: Power GUI Programming (1994)	0-442-01795-2	Law, et al	A
Objects for OS/2 2.1 (1994)	0-442-01738-3	Tate, et al	A
C Programming in the OS/2 Environment (1994)	0-442-01240-3	Gopaul	I/A
OS/2 2.1 Application Developer's Guide (1994)	0-442-01736-7	Kelly, et al	I/A
OS/2 and Netware Programming: Netware Client API (1994)	0-442-01815-0	Gauthier	A
Ventana Press: (800) 743-5369, (919) 942-0220			
Voodoo OS/2	1-56604-066-3	Taylor	B/I
Wiley (John Wiley & Sons): (800) 879-4539, (719) 548-6200			
Advanced OS/2 Presentation Manager Programming	0-471-59198-X	Burge, Celi	I/A
Designing OS/2 Applications	0-471-58889-X	Reich	I/A
Wiley: QED: (800) 879-4539, (719) 548-6200			
Art of OS/2 C Programming	0-471-58802-4	Panov, Solomon	I/A
Thinking Person's Guide to OS/2 2.1	0-471-60306-6	Tyne	B/I/A
OS/2 PM Programming for COBOL Programmers, Revised Ed. (1994)	0-471-56140-1	Chapman	I/A
Application Programming Using OS/2 REXX (1994)	0-471-60691-X	Rudd	A
Mastering OS/2 REXX (1994)	0-471-51901-4	Gargiulo	B
Wordware Publishing: (800) 229-4949, (214) 423-0090			
Learn OS/2 in a Day	1-55622-361-7	Dooley	B
Ziff-Davis Press: (800) 688-0448, (510)601-2004			
PC Learning Labs Teaches OS/2 2.1 (book/disk tutorial)	1-56276-148-X	Wilcox	B/I
OS/2 Presentation Manager Programming (1994)	1-56276-123-4	Petzold	A

NOTE: B - Beginners I - Intermediate A - Advanced

Dick Conklin is the editor of OS/2 Developer, *an independent Miller Freeman Inc. publication for commercial and corporate application software developers. He has also published five books, three of them about OS/2. Conklin can be reached via CompuServe at 76711,1005 or via Internet at os2mag@vnet.ibm.com.*

Multiboot Partitions *cont'd from p. 84*

If you want to boot DOS as well as OS/2, I would take the approach of a primary bootable partition for DOS and another primary partition for OS/2. This way, when one is booted, it cannot see the other. If for some reason you must have one bootable partition visible to the other bootable partition, then you should make one primary partition for DOS, and put OS/2 on an extended logical partition. However, if you are using this approach, you should look into Dual Boot, since the partitions can access each other anyway.

Let's assume you have one primary partition for DOS and another for OS/2 (my preferred configuration). You'll then make one or more extended logical drives for programs and data files. This way, no matter which operating system you've booted, you can see all of the programs and data. Remember that the data partition will have to be FAT, or DOS cannot see it. If you want to have your OS/2 boot partition formatted with HPFS, you may choose to have a 30MB FAT primary partition for DOS, a primary partition of the appropriate size for OS/2, and another FAT partition for your programs and data.

Another possible configuration is to have two OS/2 bootable partitions, one as the main working partition and another as an emergency backup or maintenance partition, with one or more extended logical partitions for programs and data. I've seen many such installations (including the one on my own desk).

My point here is to show you what the possibilities are. If you want to boot real DOS (not a VDM under OS/2), you need to be sure you have everything you want DOS to see in FAT partitions, either in the same partition as DOS or in an extended logical partition (since two primary partitions on the same hard disk cannot see each other). In general, I recommend Boot Manager since it provides you with greater flexibility for now and the future. It does, however, require the work of backing up and repartitioning your disk in most cases. Dual Boot, on the other hand, avoids the repartitioning but is not as flexible, and leaves OS/2 and DOS exposed to each other and, when booting to DOS, the OS/2 file system buffers are not fully flushed.

The choice is up to you, but now that you know the ins and outs, you can decide which method would be best for you.

Get the Connection!

CompuServe® gives you access to the world's largest personal information and communication service.

OS/2® gives you an operating system with unequaled versatility and reliability.

Reap the rewards of what these two can do together with Golden CommPass™, the only OS/2 software to fully automate your on-line sessions with CompuServe forums, libraries, weather and mail.

Golden CommPass
OS/2 Navigation Software

CompuServe links you to the vast and exciting realm of on-line communication.

Golden CommPass guides you through with unprecedented ease and productivity.

Available and Ready for LAN Server

Creative Systems Programming Corp.
(609) 234-1500 • Fax (609) 234-1920
Internet: 71511.151@CompuServe.com

Available and Ready for OS/2

Reader Service No. 35

DOS DEVICE DRIVERS

Q: I have some special hardware that requires device drivers under DOS. No OS/2-specific drivers are available for this device right now. Is there any way I can use it under OS/2?

A: Sure. OS/2's DOS support provides the ability to load DOS-specific device drivers in the Virtual DOS Machine (VDM) sessions. First, create a program reference object for the DOS program manually or by using MIGRATE. Then, once you have the object created, follow these steps:

1. Use mouse button two to open the context menu for the object, then select the arrow next to Open and select Settings.

2. On the settings notebook, use mouse button one to select the Session tab.
3. Click on the DOS Settings push-button.
4. Scroll down the list of settings until you get to **DOS_DEVICE**. Click on **DOS_DEVICE** and you will see a multiple-line entry field in the upper right of the page.
5. Enter the name(s) of the device driver(s) you want for this DOS session in this entry field. You must enter them exactly as you would in a DOS *config.sys* file, but without the **DEVICE** = part. For example, if your DOS-based device driver is *d:\mydd.sys*, you would enter: *d:\mydd.sys* into the entry field. Once you have entered all the device drivers (one on each line), close the settings notebook. Now, when you open this DOS session, OS/2 will load the DOS-based device driver(s) for the session.

These settings are only valid for this particular DOS session. Because the device driver does not know about OS/2's ability to run multiple sessions, it will only run the device in a single-client mode. Also, depending on the device driver, if you close this DOS session and want to reopen it, you may have to execute some program to physically reset the hardware that the device driver addresses. No general statement can be made here, since each device driver is different. But by understanding how it works, you can decide how to make the best use of this hardware and the device drivers.

MAXIMUM FILE SIZE

Q: What is the maximum file size in an OS/2 system?

A: As long as you have enough hard disk space free, the size of a single file can be as large as 2GB on the current OS/2 systems.

BOOT MANAGER

Q: How can I disable Boot Manager without removing it?

A: As you know, the Boot Manager causes a menu of bootable partitions to be displayed after the computer's power-on self-test. This menu allows you to select which partition you want the system to boot from and, unlike Dual Boot,

32-Bit Editing Power!

Tritus SPF™

The OS/2 Text Editor that Brings the Power of the Mainframe to the PC!

Compatibility. Tritus SPF emulates ISPF/PDF including modifiable panels and keyboards. Plus, it supports many additional features such as Undo/Redo and highlighting. Tritus SPF is available for OS/2, DOS, and now for UNIX (IBM's AIX on RS/6000 machines).

REXX Macros. Write your own edit primary commands utilizing IBM's REXX in OS/2 or AIX and Tritus REXX in DOS. Tritus REXX and our ISREDIT superset of over 95 commands is included with the package. A REXX language book is optional.

Great product, I'm looking forward to version 2.0!
- Dale Stroyick, BMC Software

Great Deal. Tritus SPF is only $99 which includes the DOS and OS/2 versions. Call for AIX pricing. Our Sales Department can be reached toll-free at **1-800-321-2100**.

TRITUS
6034 W. Courtyard Drive, Suite 120
Austin, Texas 78730-5014 USA
(512) 794-5800, Fax (512) 794-3833

Reader Service No. 36

OS/2 Visual Programming with GpfRexx™

Using expertise gained from years of creating the best Visual Programming Tools for C programmers, Gpf Systems has created a visual programming tool for everyone. By combining the easy to use but powerful WYSIWYG Interface Builder of Gpf with the easy to use but powerful REXX language that comes with every OS/2 system, now you can create your own PM applications, even if you've never used Gpf or REXX before. Point, click, drag, and drop to build striking PM applications that take advantage of the advanced features of OS/2.

Visual Programming
Visual GUI programming for REXX; the most natural way to program a Graphic User Interface.

Simple but Powerful
Simple to use but powerful WYSIWYG Interface Builder which can create basic or advanced applications without detailed system level knowledge.

Getting the Most from OS/2
Take advantage of advanced OS/2 features: Multi-Tasking, SQL DataBase, Multi-Media, Multi-Media Controls, Communications (APPC, CPI-C, EHLLAPI)

FEATURES
- Point and click programming
- Multi-thread programming
- Nested menus to any level
- Fully integrated true WYSIWYG interface builder
- PM programming without system knowledge
- Support for CUA 91 controls
- Supports Multi-Media at design and run time
- Supports user designed custom controls
- Control fonts and colors for windows and controls
- Easy inclusion of Bitmaps and graphics
- Context sensitive help for windows and controls
- Point and click access to DB2/2 SQL databases - and REXX supported Embedded SQL access to DB2/2 APIs
- Multi-thread source level debugging
- Royalty FREE - Configurable run-time

Gpf SYSTEMS, INC.
Phone: (800) 831-0017 or (203) 873-3300
Fax: (203) 873-3302
30 Falls Road, Moodus, CT 06469

Reader Service No. 37

you don't have to share a partition between operating systems.

If you regularly boot from one partition and have others as backup or utility partitions, you can disable the menu by opening a full screen or windowed command prompt and typing **SETBOOT /T:0.**

The next time you boot the system, the Boot Manager menu will not be displayed. To turn the menu back on, type **SETBOOT /T:30**, which will set the menu time-out back to 30 seconds. The next time you boot the system, the Boot Manager menu will appear.

Another alternative is to use FDISK to set the active boot partition and remove the other bootable partitions from the Boot Manager menu. Note: do *not* delete the partitions, just remove them from the menu.

DELETING TEMPLATES

Q: How can I delete templates that cannot be dropped on the shredder?

A: If you do find the need to delete one or more templates, you should first try to drag it to the shredder by using mouse button two. If, when trying to drop the template on the shredder, you see the symbol indicating you cannot drop it there, follow this procedure:

1. Open the context menu for the template by pointing to it with the mouse, then clicking on button two.
2. Using mouse button one, click on the arrow next to Open. Then select Settings.
3. Again using mouse button one, select the General tab.
4. The Template check box will be checked. Click on this with mouse button one to remove the template attribute. Then, close the settings notebook.
5. Now, using mouse button two, drag the (former) template to the desktop.
6. Open a command prompt, and type: cd \desktop <Enter>.
7. Now use the del command to delete the name of the object you want.

SWAP FILE

Q: Every now and then I get a black screen with a box of asterisks telling me the swap file is full and my system has stopped. What causes this problem? How can I avoid it?

A: OS/2 affords you the use of virtual memory. Simply stated, you can use more memory than is physically available in the system. OS/2 accomplishes this feat by moving unused pieces of data to a swap file on the hard disk to make room for new information. When this swapped data is subsequently needed, OS/2 will swap out other parts of memory to make room to bring it back into physical memory. The swap file resides on the hard disk.

The amount you can over-commit memory depends on the size of the hard disk, and how much of that disk you wish to devote to the swap file. The swap file size is specified in the *config.sys* file with the **SWAPPATH** statement. For example in the line

```
SWAPPATH=C:\ 4096 2048
```

the swap file, *swapper.dat*, will be placed in the root directory of the *c:* drive. The initial size of the swap file (recreated each time the system boots) will be 2,048KB (2MB) and the **minfree** is 4,096KB (4MB). What this says is that when something occurs (usually a memory allocation) that will cause the swap file to grow into the last (in this case) 4MB of the *c:* drive (where the swap file resides), a warning will be displayed saying that the swap file is full and suggesting that a program be terminated because system resources are getting dangerously low. Actually, the swap file is not full. Another 4MB are left, but if you ignore this message and continue (the message tells you not to), the physical end of the disk may be hit. If this problem occurs, the box of asterisks is displayed and the system is physically halted immediately. It happens because there is no way to move memory to the swap file and operating system code that needs to be reloaded cannot be reloaded, so the system can no longer function properly.

If you follow the instructions in the warning, you should never encounter this problem, but there may be times that you do. If so, you should edit your *config.sys* file and raise the **minfree** number by 2MB, then restart the system. There may be times when you have so many things running in the system that by the time the swapper wants to put up the warning, some other program has come along and caused the end of the disk to be hit.

The window of possibility for this situation is small, but it is possible, so you should be aware of it.

In general, this message should not appear, but if it does, it indicates that your system is severely over committed and you should look into adding more physical memory and/or disk space where the swap file resides. You are sim-

ply exceeding the physical limits of your computer.

REMOVING THE WPS

Q: I am using a single application and don't want to have the overhead of the Workplace Shell in memory.

A: You can set up the system to run without the Workplace Shell but still have the functions of the Presentation Manager (the graphical, windowing subsystem) available for applications, or you can go even further and set up the system for a single, full-screen command-line session. These options are useful for systems that are single "line-of-business" applications, or even LAN servers that live in a closet and have no use for a graphical user interface.

To run without the Workplace Shell, you should replace the line:

```
SET RUNWORKPLACE=
 X:\OS2\PMSHELL.EXE
```

in the *config.sys* file with:

```
SET RUNWORKPLACE=X:\OS2\CMD.EXE
```

(where X is the drive you have OS/2 installed on).

This configuration will give you a single, windowed command line from which you can start full-screen as well as Presentation Manager applications. Note that when you reconfigure the system, you have no visual interface to the print subsystem even though the spooler is active, and you have no way to configure the operating system other than what you can with *config.sys*.

If you want to go even further and not even have Presentation Manager active, you can change the line:

OS/2 affords YOU THE USE OF VIRTUAL MEMORY

SIMPLY STATED, YOU CAN USE MORE MEMORY THAN IS PHYSICALLY AVAILABLE IN THE SYSTEM.

```
PROTSHELL=X:\OS2\PMSHELL.EXE
```

to:

```
PROTSHELL=X:\OS2\CMD.EXE
```

(where X is the drive you have OS/2 installed on) in the *config.sys* file.

This approach will completely replace the shell with a single, full-screen command prompt. From here, you can start programs or other sessions, but you are limited to text-mode programs.

In either case, you should be sure to shut down your system as cleanly as possible. Because the Workplace Shell is not active in either case, you cannot get the shutdown menu. Since the job of shutdown is to flush the Workplace Shell and file system buffers, (See "Tips and Tricks," *OS/2 Magazine*, Premiere issue pp. 90-96), and the Workplace Shell is not active, you only have to worry about the file system buffers. You can force them to flush by using <Ctrl-Alt-Del>. So, in these configurations, be sure that you shut down with <Ctrl-Alt-Del> after closing all applications and before powering off the system.

INF FILES

Q: I like the IBM-supplied information files such as *Start Here* and the OS/2 Command Reference. How can I create files like these for my applications?

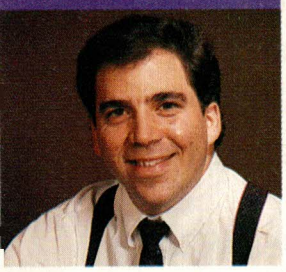
A: These on-line books are INF files, created with the same tool that programmers use to create OS/2 application help files. It uses the Information Presentation Facility (IPF) that comes as a part of OS/2.

If you want to create files of your own, you must have the Information Presentation Facility Compiler (IPFC) that is part of the OS/2 Developers' Toolkit. Usually, this tool takes help panel files and compiles them so that they can be used by an application. You can also create on-line books (INF files) in a similar manner.

The IPFC understands a tag markup language that is a subset of the IBM Bookmaster tags. These are documented in the tool kit, along with some sample files. You will create a tagged file and run the IPFC file against it as you would if you had a help file, but you add in the flag: */inf* (for example: IPFC *myfile.ipf /inf* <Enter>).

This flag tells the IPFC to create an INF file. Then, by using the VIEW utility that is included as a part of OS/2, anyone can view your new book.

David Reich has been with the OS/2 Development Team in Boca Raton, Fla. since 1987. He has written numerous articles for OS/2 Developer *magazine and is the author of* Designing OS/2 Applications *(Wiley and Son's, 1994). David can be reached via CompuServe at 76711,632 or via Internet at speedracer@vnet.ibm.com.*



More Questions and Answers

MULTIBOOT, ON-LINE BOOKS, DOS DEVICE DRIVERS, AND MORE

BY DAVID REICH

MULTIBOOT PARTITIONS

Q: I want to partition my disk to be accessed by both DOS and OS/2. What is the best setup?

A: You may get many different answers to this question, depending on who you ask. You must first understand that DOS cannot see High Performance File System (HPFS) partitions. DOS does not understand HPFS. So first, any partition you wish to be able to see when booted under DOS must use the File Allocation Table (FAT) file system. You then have the option of using either Dual Boot or Boot Manager.

Dual Boot was IBM's first offering for OS/2 users who wanted to boot both DOS and OS/2. It shares the same bootable partition on a drive between DOS and OS/2 and therefore must be a FAT formatted partition. To install Dual Boot you should have DOS on the partition and then install OS/2. When it asks if you want to format the drive, answer no. This action will cause the system to give you a dual boot machine.

The other alternative is to use Boot Manager, which allows you to choose from several bootable partitions on the disk(s). These do not even have to be primary partitions. Boot Manager also allows you to boot from an extended logical drive. Using Boot Manager, you do not have to share a partition among operating systems, so you can have a partition for DOS and another for OS/2 (and potentially others for other copies of DOS, OS/2, or other operating systems). Remember, however, that for DOS to see a partition, it must be formatted FAT.

One other point about DOS and FAT partitions is that on any given physical disk, DOS can see all FAT partitions up to the first HPFS formatted partition. DOS can see no partitions after that. So, for example, if you have three partitions, FAT, HPFS and FAT, DOS can only see the first FAT partition on the drive. The other FAT partition is not accessible from DOS. This function is on a per-physical-drive basis. My recommendations are:

1. Try to avoid Dual Boot systems. It is my experience that in this partition-sharing environment, DOS programs can accidentally step on OS/2 system files or vice-versa, possibly rendering the other unbootable. Another thing to consider is that when one executes the **boot /dos** command to boot DOS instead of OS/2, a proper system shutdown is not performed, which can leave unflushed buffers and lazy-write caches.

   Dual Boot is good for users who want to install OS/2 on an existing DOS machine and do not want to reconfigure hard disk partitions. I personally think you are better off making the effort to organize your system for two operating systems, but if you are really against backing up and repartitioning your disk, Dual Boot is the way to go.

   To take it one step further, if you just want to install over DOS without booting DOS again and without having to repartition, you can just create this Dual Boot configuration, then remove all of your DOS files, including *boot.com*, which is the program used to switch between DOS and OS/2. This approach will effectively give you a single-booting OS/2 system.
2. If you couldn't already tell, I prefer Boot Manager. It provides the most flexibility for immediate and future use, allowing you to boot off extended logical drives and other physical drives. The other side of the coin is that you will very likely have to repartition your hard disk(s) to set it up optimally.

   You can put the Boot Manager anywhere on the hard disk through the FDISK program. Once you have it installed, you use the FDISK menus to add bootable partitions to the Boot Manager menu. These partitions will then appear the next time you boot the machine. The next question is, which partitions should you make and for what?

Multiboot Partitions *cont'd on p. 80*

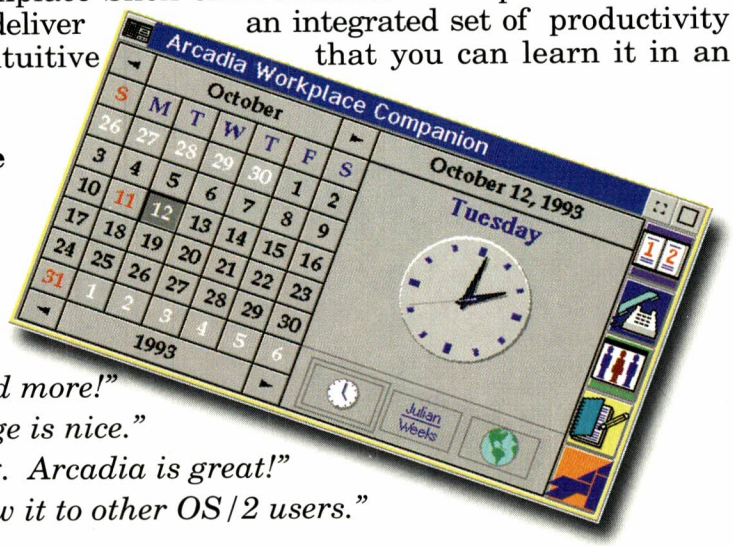
Ready!™ for OS/2

ARCADIA: THE EASIEST OS/2 APPLICATION

"A PIM with a twist: This one's for OS/2"

- *PC Magazine*, September 28, 1993

The Arcadia Workplace Companion is a personal information manager (PIM) designed specifically for the OS/2 2.1's 32-bit Workplace Shell environment. It exploits all of the powerful capabilities provided by OS/2 to deliver an integrated set of productivity tools. Its object-oriented design is so intuitive that you can learn it in an extremely short period of time.



Here is what Arcadia's customers are saying:

- *"Love the product."*
- *"Keep up the good work."*
- *"Overall - very impressive."*
- *"Exactly what I've been looking for... and more!"*
- *"Having everything in a compact package is nice."*
- *"I was afraid to switch and I was wrong. Arcadia is great!"*
- *"Well designed and thought out. I'll show it to other OS/2 users."*

CLOCK/CALENDAR

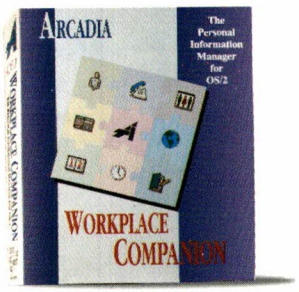
This module is the focal point of Arcadia Workplace Companion. The Clock/Calendar shows the current date and time and provides the launching pad for all of the other modules.

APPOINTMENT BOOK

The Appointment Book is an ideal way to schedule your day's events. Appointments may have notes and alarms attached to them and you can even launch applications at specified times.

TO-DO LIST

The To-Do List is a convenient way to manage immediate or long-range tasks. To-Do List items may be prioritized by number or date. You can even add appointments to the To-Do List by simply dragging them from the Appointment Book.



* Call for the list of qualified competing PIM products.

Limited-time Offer!

$49.95* *Competitive Upgrade*

Offer expires on 1/31/94

$149.95 *Suggested retail price for new users*

For more information or to order, call Arcadia's dealer:

Indelible Blue, Inc.

1-800-776-8284

Ask about special pricing for OS/2 bundle: #AR3

Arcadia Technologies Inc.

735 West Duarte Road, Suite 207
Arcadia, California 91007

Arcadia Workplace Companion is a trademark of Arcadia Technologies
OS/2 and OS/2 Ready! are registered trademarks of IBM Corporation
CompuServe is a registered trademark of CompuServe, Inc.
PC Magazine is a trademark of Ziff-Davis Publishing Company

TELEPHONE/ADDRESS BOOK

The Telephone/Address Book is a convenient way to store the names, numbers, and addresses of all of your important contacts. You can even specify notes and custom information about each person in your Phone Book.

A built-in phone dialer is linked directly to sophisticated call tracking facilities. When you place a call, the number is automatically dialed and you can log the call's information.

CONTACT LIST

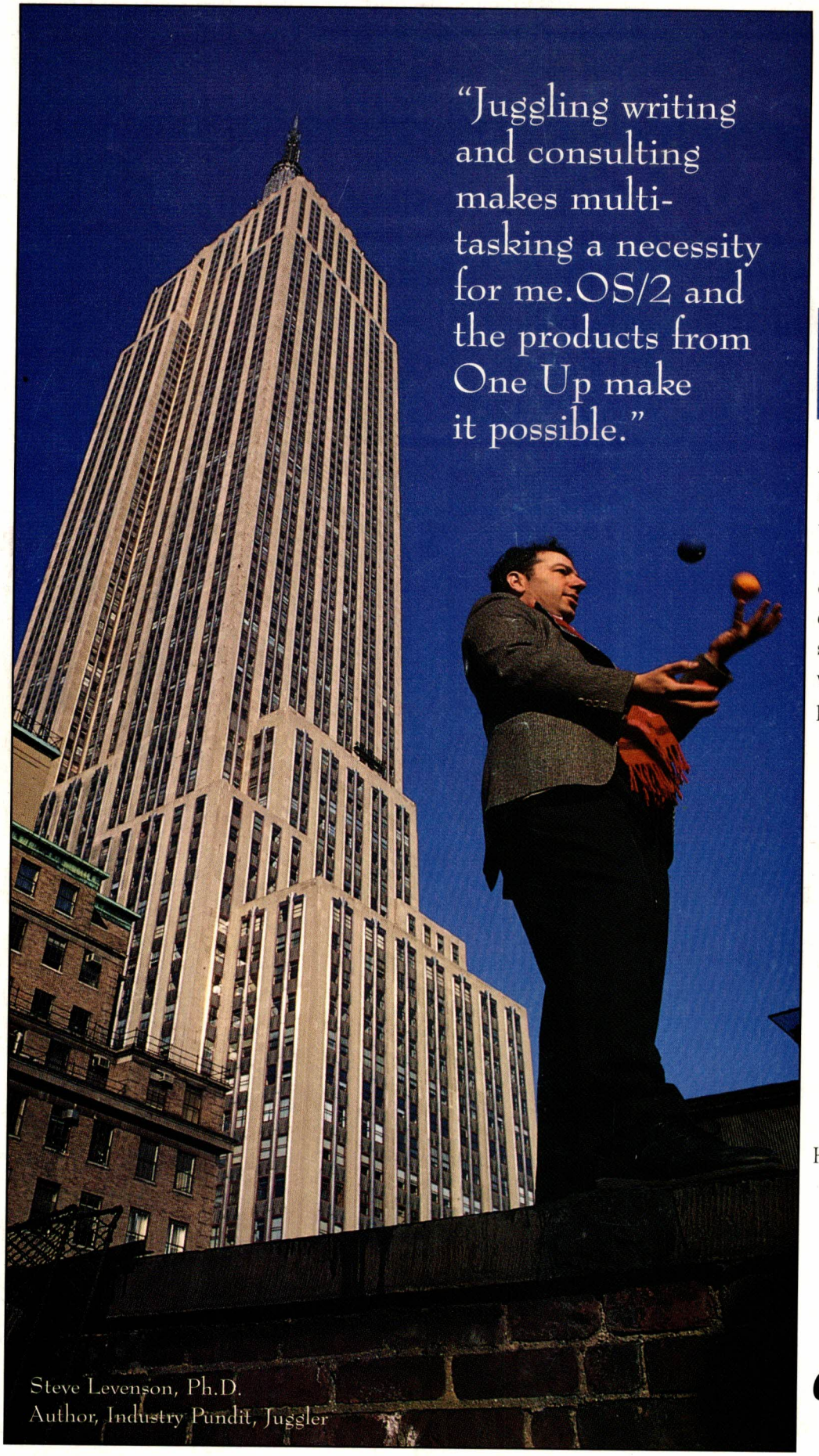
The Contact List helps you keep track of important contacts, relatives and friends. A subset of the Phone Book, you can use the Contact List to gather all of the people that you contact frequently. Its compact size lets you keep it open without taking up a lot of space on your desktop.

NOTEPAD

The Notepad module is a free-form notebook that allows you to store almost any type of information you desire. One or more pages can be inserted anywhere in the Notepad. Each page may contain either text or graphics.

(818)446-6945 (Voice)
(818)447-4212 (Fax)
75600,1105 (CompuServe)

Reader Service No. 38


"Juggling writing and consulting makes multi-tasking a necessity for me. OS/2 and the products from One Up make it possible."
Steve Levenson, Ph.D.
Author, Industry Pundit, Juggler

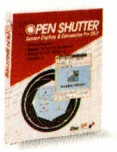
If you're into multi-tasking, then you're into OS/2. When I'm juggling between programs, the variety of products from One Up keep me up and running. In fact I couldn't have written my new book, *Now That I Have OS/2 On My Computer- What Do I Do Next*, without Open Shutter, and the after sale support was top notch.

Ready! for OS/2™

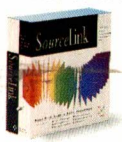
So, whether you're an expert or just beginning, do what I did, keep your system perfectly balanced with the high performance products from One Up.

Window Washer v 2.0
The best selling screen saver.

Open Shutter v 1.11
The ultimate in screen capture.



SourceLink v 2.0
Hyperlink access to source code.



One UP Corporation

For a dealer near you call
800-678-01UP

Reader Service No. 39